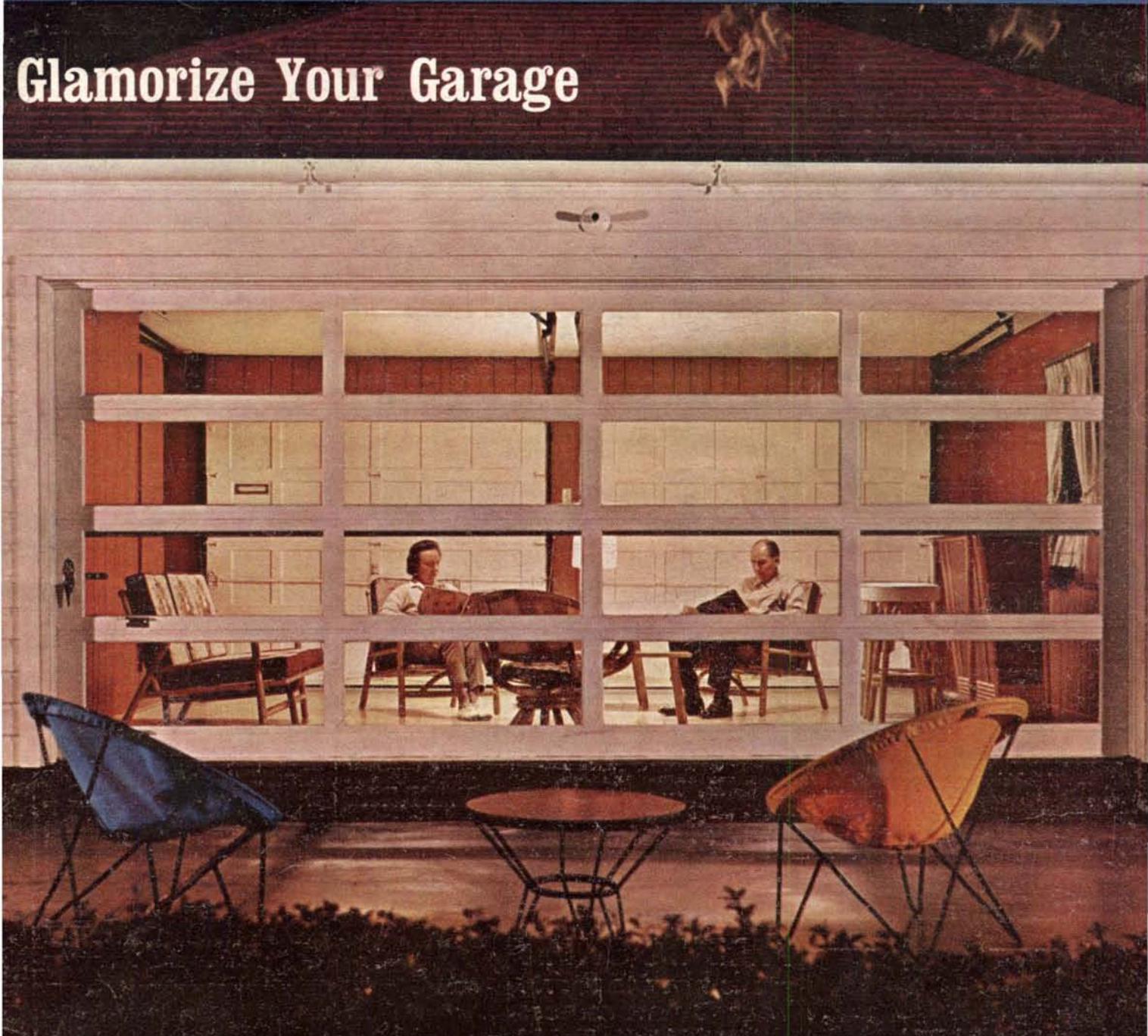


WORKBENCH

35c / MARCH-APRIL / 1964
160

Glamorize Your Garage



Ants Under Lamps

Sheet-Metal Brake

Maple, Cherry, and Mirror

Contemporary Coffee Table



You Schedule the Orders while Your Servicemen Bring You **\$18 an hour gross profit**

Yes, that is your hourly gross profit from the work of only three servicemen . . . at "national-price-guide" rates. And this is much easier to do than you think. We show you how . . . step by step. Duraclean dealers find it is easy to gross \$6 per hour on EACH serviceman plus \$9 per hour on any service they themselves render. Your income is limited only by the number of servicemen you employ. The 24 page illustrated booklet we'll mail you (with no obligation) explains how most of your gross profit becomes a **clear net profit** to you.

Start while Continuing Present Job We furnish all the equipment . . . and help finance you

If you've wanted to BE YOUR OWN BOSS . . . to become financially independent . . . have a fast growing income . . . and own a Nationally Advertised business, now YOU CAN.

You can stay at your present job while your customer list grows . . . then switch to full time, lining up jobs for your servicemen to do.

One small job a day brings a good starting income. As you add full or part-time servicemen, your income is limited only by your own effort.

Dealers operate from a shop, office, or their home. Equipment is portable . . . the electric

Foamovator converts to a convenient carrying case.

At the start, you may want to render service yourself . . . or you can start out with servicemen. This business is easy to learn . . . easy to start . . . so easy to service that women dealers often do it. We prefer you have no experience . . . not have to "unlearn" old methods.

We are NOW enlarging this worldwide system of individually-owned service businesses. If you are reliable, honest and willing to work to become financially independent, we invite you to mail the coupon.

It's Easier than You Think to Start Your Own Business

When you receive our illustrated booklet, you will see the way we show you step by step how to quickly get customers . . . how to steadily build more customers from their recommendations.

All six services are rendered "on location" in homes, offices, hotels, theaters, churches, clubs, motels and institutions.

These superior, safer and convenient methods spread Duraclean dealerships throughout North and South America, Africa, Portugal, England, Israel, Norway and many other countries.

National Magazine advertising explains the

superior merits of your services, builds your customer confidence and brings job leads to you.

We and a Duraclean dealer will train you and assist you. He'll reveal his successful, proven methods. We show you all you need to know.

You have pre-tested newspaper and yellow-page ads, commercials, and a full mailing program.

Furnishings stores, insurance adjustors, and decorators refer jobs to our dealers. These year 'round services are in constant demand.

TODAY is the time to reserve a Duraclean dealership . . . before someone takes your location,

Start Small, Grow Big . . . in this Booming Business

Many men have said to us, "I can't afford to give up my job till I know I have a sure thing . . . a sound business that will provide both security and a better living for my family."

That made sense to us so we worked out such a plan . . . and those same men are now enjoying Duraclean dealerships in many communities. You don't experiment. You use tested, proven methods. You have our backing and "know how."

Does this appeal to you? Don't decide now. Mail the coupon so you'll have the facts to decide wisely. There is no obligation whatsoever. You will then know whether this is what you want.

You can start small and grow big just as we did. A third of a century ago Duraclean was an idea . . . but it caught fire and spread rapidly to a worldwide service. It spread because it was based upon (1) superior processes and (2) proven customer-getting methods.

Our first service, the care of carpets and upholstery, exemplifies these superiorities. It not only cleans; it enlivens the fibers . . . revives dull colors. Pile rises with new life. Furnishings are used again in a few hours.

There's no machine scrubbing. No soaking. Duraclean cleans by absorption. Mild aerated foam lightly applied, lifts out dirt grease and many unsightly spots like magic.

Government figures show service businesses growing faster than industries and stores . . . \$750 million yearly potential just in rug and furniture cleaning. You have 5 other services.

Space here will not permit describing your other services but they are fully explained in the free booklet we'll mail you. You have six opportunities for profit on every job.

A few hundred dollars establishes YOUR OWN business. A day's profit more than takes care of the monthly payments we finance for you.

Men frequently take in partners.

We furnish electric equipment and enough materials to return your **TOTAL** investment. If you have good habits and know the importance of customer satisfaction, you can likely qualify for a Duraclean dealership.

It's been said, "Opportunity knocks but once at every man's door." This could be that one rare opportunity in your life.

It is surprisingly easy to learn this business. You can decide from the information we will send you whether to apply for a dealership. So, with no obligation whatever, mail the coupon TODAY.

The Duraclean Route to Success

in a dynamic business of your own

What it can mean to you



Mail this coupon TODAY It may put you in business

Duraclean Co., 4-563 Duraclean Bldg., Deerfield, Ill. 60015
With no obligation, mail letter with 24 page illustrated booklet explaining how I can increase my income and family security with a Duraclean Dealership.

Name _____

Address _____

City _____ Zone _____ State _____

Resale Service

If, because of illness, moving or for any reason a dealer wants to sell, we maintain a service to locate buyers and to help him sell.

Dealerships resell at up to 10 times the dealer's cost. R.D.K., after 5 months, sold for \$2,000 above his cost. L.L., after 30 months, got \$7,116 more than he had paid. The value of your dealership and franchise grows monthly.

FREE BOOKLET tells how to Start Your Own Business

With no obligation, we'll mail you a letter and 24 page booklet explaining this business . . . how and why your income grows . . . how we help finance you.

Then decide if this opportunity fulfills your dream of independence and a much bigger income.

Your location should be taken tomorrow . . . so mail coupon today.

Find Out with NO OBLIGATION

To keep the cover intact—use duplicate coupon for this advertisement on page 2.

THE
Castoliter
PROJECT MANUAL

Published by The Castolite Company, Woodstock, Illinois, U.S.A.

The Castolite Project Series illustrates how to use Castolite Liquid Plastics for Casting, Laminating, Coating and Melting.

25c per copy



HOW YOU CAN
GLAMORIZE
YOUR KITCHEN
WITH
CASTOGLAS



THIS NEW BOOK SHOWS YOU HOW:

HOW TO POUR YOURSELF A KITCHEN COUNTER AND TABLE TOP and produce a plate glass or satin finish that is water, stain- and heat-proof.

HOW TO CAST YOUR OWN NATURE AND ART TILES with embedments of natural flowers, leaves, butterflies, coins and other interesting objects.

HOW TO LAMINATE DECORATIVE GLASS PANELS for screens, room dividers, and also make beautiful trays, placemats and other accessories that are distinctively different.

HOW TO MAKE OLD TABLE TOPS NEW and produce a high-quality finish unlike anything ever seen before, and do all this for an average cost of only 15c per sq. ft.

CASTOGLAS POURS LIKE HONEY AND SETS LIKE GLASS

Within 60 Minutes at Room Temperature

You can cast it, laminate it, flow it on or paint with it. You can mix your own transparent, translucent or opaque colors. No heat or pressure is required and hence no special tools and no equipment. We furnish all needed materials and complete illustrated directions.

THIS BOOK ALSO CONTAINS MANY OTHER EXCITING 'DO-IT-YOURSELF' IDEAS that are practical, economical and easy to do. One hundred 'how-to-do-it' photos and sketches and detailed descriptions tell the whole story in language you can understand. 24 Thousand copies sold the first 2 months.

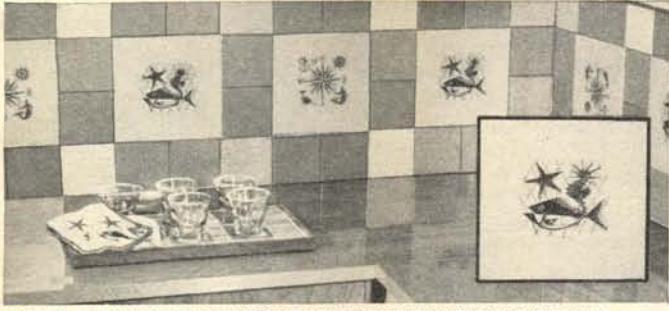
Please send 25c for this money-saving booklet to Dept. D-9.

THE CASTOLITE COMPANY • Woodstock, Illinois

The titles below and the other photographs on this page are from the "Kitchen" booklet shown at left.



TILES MADE WITH NATURAL MAPLE LEAVES, ferns and grasses enhance the colorful work center in this handsome country kitchen.



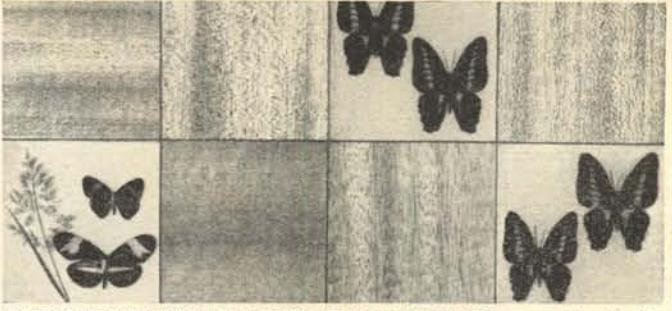
PAPER NAPKINS LAMINATED TO WOOD TILES WITH CASTOGLAS grace this kitchen wall. Paper becomes transparent and only design remains visible.

CASTOGLAS IS WATERPROOF, STAIN PROOF, FADEPROOF AND UNAFFECTED BY: boiling water, hot pots or pans, alcohol, vinegar, fruit juice, hot grease, tea, coffee, milk, oils, naphtha, cleaning fluids, benzene, gasoline, ink, dyes, pigments, wax crayon, lead pencil, to name but just a few. Withstands all kinds of abuse. Will not "waterspot" and is as easily cleaned with a damp cloth as any glass surface.

HOW TO COVER THE KITCHEN COUNTER WITH CASTOGLAS—see photos from left to right: Counter is made of $\frac{1}{4}$ inch thick flakeboard with border of walnut tiles. Hardener is mixed with liquid Castoglas, poured over



IS THERE A BUDDING REMBRANDT IN THE FAMILY? Paint your own designs on wood, protect with Castoglas. Countertop is Castoglas-treated birch.



CASTOLITE TILES WITH EMBEDMENTS OF BUTTERFLIES are combined with wood tiles. Castoglas-treated Striped Mahogany gleams like burnished gold.



clean-sanded wood and covered with laminating film. Castoglas hardens in about one hour. Film is stripped off and finished counter has appearance of plate glass bonded to wood.



LEARN WOODWORKING AT HOME

Complete Home
Training Course in
Woodworking and
Cabinetmaking
Now Available

Today—it's easy to acquire the skills and craftsmanship of fine woodworking and cabinetmaking with Interstate's complete "shop method" course. Prepared by expert instructors, the course consists of 22 profusely illustrated training manuals containing more than 1100 pages of instruction. Covers all phases of woodworking, including selection of woods, planning and laying out projects, correct use and care of all hand and power tools, joint making, cutting, assembling, finishing, simple upholstery, etc. Over 75 learn-by-doing instruction projects give work bench training and experience in actual construction. Course is approved for beginners and professionals alike.



Send for Free Booklet Today!

INTERSTATE TRAINING SERVICE

Dept. F-7, Portland 12, Oregon

Please send free booklet on your complete Craft Career course in Woodworking and Cabinetmaking.

Name _____

Address _____

City _____ Zone _____ State _____

—Coupon for Advertisement on Second Cover—

Mail this coupon TODAY

It may put you in business

Duraclean Co., 4-563 Duraclean Bldg., Deerfield, Ill. 60015

With no obligation, mail letter with 24 page illustrated booklet explaining how I can increase my income and family security with a Duraclean Dealership.

Name _____

Address _____

City _____ Zone _____ State _____

"Jorgensen"
and
"Pony"

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hold your work
These and many
other designs de-
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request. For big,
32-page "HOW-TO-
CLAMP-IT" catalog,
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ADJUSTABLE CLAMP CO.
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EXPERTLY DUPLICATE Turnings, Carvings, Etc.

right on your own lathe accurately & fast. All from easy to make templates or original pieces. The new, larger NEW off-the-lathe No. 4 CARVER MODEL shown here duplicating a valuable mahogany bust from an inexpensive ceramic one! Send 25 cents in coin for literature. REFUNDABLE ON FIRST ORDER. Write TODAY!

TURN-O-CARVE TOOL CO., Dept. W-464
P.O. Box A, Santee, California



WORKBENCH

volume 20 number 2

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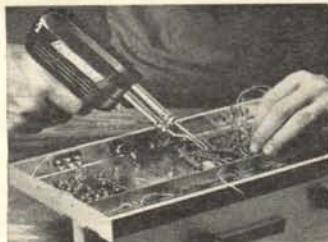
*Get two soldering temperatures
in a single soldering tool!*

Weller® Dual Heat Soldering Gun Kit

Everything that's needed for quick, easy soldering and scores of household repairs. Features the same Weller "Expert" Dual Heat Gun that's used by professional servicemen and homecrafters the world over. Pull the trigger—tip heats instantly and spotlight illuminates work. Two trigger positions give a choice of two soldering temperatures. You can switch instantly to high 140-watt or low

100-watt heat to suit the job. By using high heat only when necessary you prolong tip life. Tip is made of copper for superior heat transfer and premium plated for rigidity and long life. Included: 3 soldering tips, tip-changing wrench, flux brush, soldering aid, solder. And everything is in a colorful, break-proof plastic carrying case. Model 8200PK. **\$8.95** list
Weller Electric Corp., Easton, Pa.

For hi-fi kit building



For electrical repairs



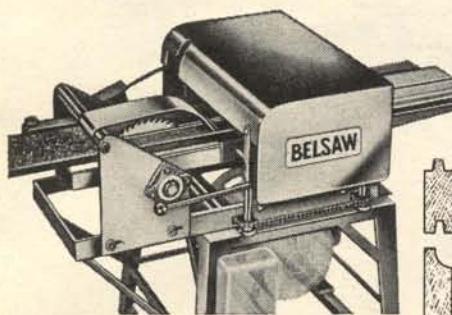
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PLANER MOLDER SAW!



Now you can use this **ONE power feed** shop to turn rough lumber into high-value moldings, trim, flooring, furniture . . . **ALL** popular patterns.

RIP . . . PLANE . . . MOLD . . . separately or all at once by power feed . . . with a one horse-power motor. Use 3 to 5 HP for high speed commercial output.

LOW COST . . . You can own this **MONEY MAKING POWER TOOL** for only **\$30.00**

down payment

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BELSAW POWER TOOLS

964 Field Bldg., Kansas City 11, Missouri

Send me complete facts on the **MULTI-DUTY Power Tool**. No obligation.

Name

Address

City

State

Letters to the Editor

Dear Mr. Hedden:

In the Modern Sofa, pages 26 to 29, Nov.-Dec., 1963, I can find no complete dimensions for the long tapered pieces of the base.

V. M. Meserve, Hendersonville, N. C.

Dear Mr. Meserve:

Sorry about the oversight. The base members are cut from $1\frac{1}{8}$ x $3\frac{5}{8}$ -in. hardwood. The center section of the base thus is $3\frac{5}{8}$ in. high. From the center span of $11\frac{1}{2}$ in. the long pieces taper down to $1\frac{1}{2}$ in. The over-all width of the base from front to back is $22\frac{1}{2}$ in.

Dear Mr. Hedden:

Enclosed is the money for renewing my subscription. Also am sending along a photo of a cradle I made of walnut.

J. H. Burgen, Elkhart, Iowa.



Dear Mr. Burgen:

We thank you for the subscription renewal. The cradle is a fine piece of work. We have had requests for a cradle, and will have an article showing how to build one in a future issue.

Dear Mr. Hedden:

Have made some of the tools described in your gem cutting article and several friends have asked me to make machines for them. Did not realize this was such a popular hobby.

C. S. Smith, Chicago.

Dear Mr. Smith:

Evidently amateur gem cutters are not much for talking, as gem cutting (lapidary, to be technical), is one of the most popular of all hobbies. Even large companies like Carborundum recognize this. For a free copy of a booklet "An Introduction to the Art of Lapidary", write to the company at P. O. Box 337, Niagara Falls, N. Y.

Dear Mr. Hedden:

In answer to Mrs. A. O. of Knoxville, Iowa, regarding the problem of keeping a finish on redwood siding, my solution was to first strip off all the old varnish and finish. I applied Rez Wood Red stain and it is still in good shape after two years of weathering.

Have had many compliments on the Colonial Desk-Chest I made from plans in the Jan.-Feb., 1963 issue of WORKBENCH. Am enclosing a photo of another desk made from red cedar.

C. C. Rush, Jasper, Mo.



Dear Mr. Rush:

Thanks for the tip on the Redwood stain. The desk looks like a fine job.

Dear Mr. Hedden:

Always glad to get WORKBENCH, wish it was monthly. Noted in a past issue a tip by a Mr. Fox about using kerosene in clocks to prevent rust and provide lubrication. Emigrated from England in 1952, and over there kerosene is used in every grandfather clock.

Made a birdbath from plans in WORKBENCH, entered it in the Marshall County Fair and won second prize; cherish that red ribbon.

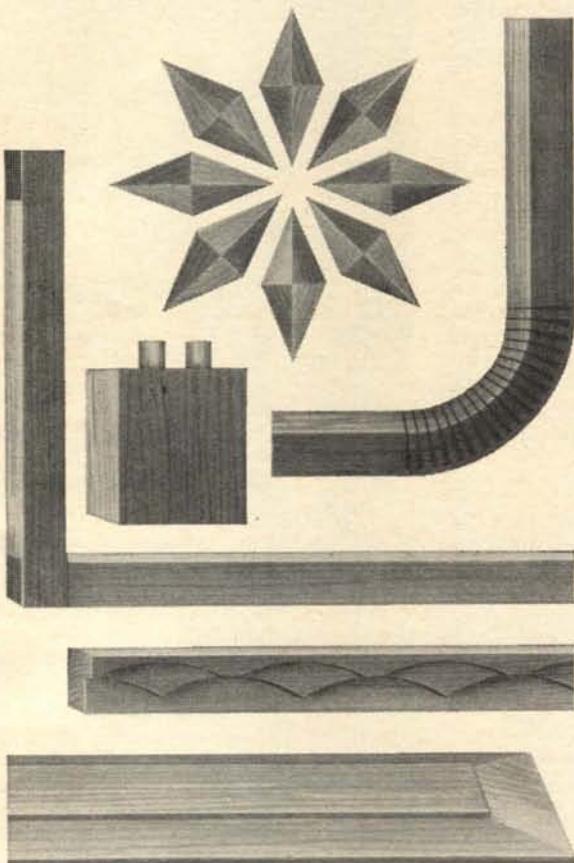
H. Longworth, Moundsville, W. Va.

Dear Mr. Longworth:

Delighted to hear you like our magazine. We will have an article in a future issue on pictorial marquetry by W. A. Lincoln of London. He also writes for the "Wood-worker", an excellent do-it-yourself magazine published in England.

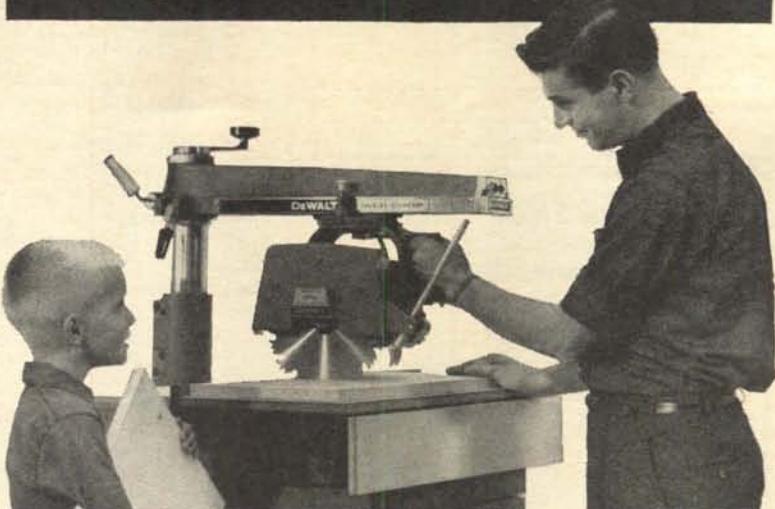
We add our congratulations on winning the prize; we published the plans, but you provided the craftsmanship that earned the award.

**A short cut
to expert
woodworking:
A DEWALT
POWER
SHOP®**



Your DEWALT Power Shop is the Open Sesame to expert woodworking. With it, you can saw, size, bore, joint, dado, shape, sand, rout, grind, buff... or do any of a hundred or more precision operations. It'll save you hundreds of dollars in separate tools. And your DEWALT dealer will teach you how to use it!

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Please send free 16-page Woodworking Booklet.
 I enclose \$3.95 for 176-page book: "Newest Ways to Expert Woodworking." (Check or Money Order—Please, no C.O.D.)

Name.....

Address.....

City..... Zone..... State.....

NEW-BRIAR PIPE DISCOVERY

WILL YOU TEST SMOKE THIS DEMONSTRATOR AT OUR RISK?

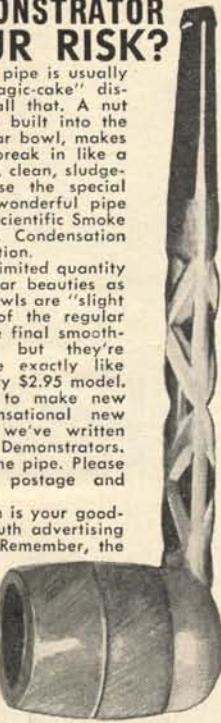
Breaking in a new pipe is usually torture, but this "magic-cake" discovery will change all that. A nut sweet cake, specially built into the genuine imported briar bowl, makes this mellow beauty break in like a dream. You'll get dry, clean, sludge-free smoking, because the special construction of this wonderful pipe utilizes the 3 C's of Scientific Smoke Control — Combustion, Condensation and Capillary Attraction.

We've set aside a limited quantity of these imported briar beauties as Demonstrators. The bowls are "slight seconds" taken out of the regular production line before final smoothing and polishing, but they're guaranteed to smoke exactly like our regular top quality \$2.95 model.

Because we want to make new friends for this sensational new kind of briar pipe, we've written off the cost of these Demonstrators. Send us nothing for the pipe. Please send 25¢ to cover postage and handling.

All we ask in return is your good-will and word of mouth advertising if you like the pipe. Remember, the risk is ours, you can't lose. Sorry, only 1 Demonstrator to a family on this non-profit transaction. (Good in the U. S. A. only).

PIPE SHOWN 2/3 ACTUAL SIZE



WALLY FRANK Ltd. Dept. J149
132 Church Street, New York 7, N. Y.
I enclose 25¢ Send me the Demonstrator Pipe described above. Please Print Name and Address Below.

EARN EXTRA MONEY With Amazing "HEXE" AUTOMATIC NEEDLE THREADER

The Outstanding Demonstration Seller that threads all size needles with the simple press of a button.

MAKE UP \$7.00 AN HOUR

by simply showing people how this unique and useful device operates. Ideal for gifts, fund raising, or party give-aways. Men as well as women will be fascinated by this mechanical wonder. SELLS ITSELF wherever there are people for only \$1.00, plus \$1.00 PROFIT SALES PLAN shows you how.

Writes W. H. Calif. — "Was amazed and delighted the way your threader sold. Sold six dozen in two days at the plant where I work, and now I need six dozen more."

BUT—Don't take our word for it. Act today and see for yourself. Order at these low prices:

1 Dozen Threaders \$ 4.75 . . . Your profit \$ 7.25
3 Dozen Threaders \$13.00 . . . Your profit \$ 23.00
12 Dozen Threaders \$40.00 . . . Your profit \$104.00
(Or, Send \$1.00 for 2 Demonstrator Samples.)

Save Shipping Cost—We pay all transportation charges when full payment is included with order. (C.O.D. orders must include 5% deposit, return guarantee, and your money refunded.) ACT TODAY!

NORTHERN IMPORTERS, Dept. B-34
2453 Morse Ave. Chicago 45, Ill.



MAKE
RIPPING
A CINCH



Clamps to saw table with a twist of the hand. No drilling or tapping. Aluminum—fits all saw tables from 8" to 14". 10 Day Moneyback Guarantee. SWANSON, 4044-A Dean Dr., Oaklawn, Ill.

Dear Mr. Hedden:

In the Nov.-Dec., 1963 issue, Mrs. C. S. L., Vermont asks about installing a damper in an old fireplace. I had the same problem, involving a fireplace with a chimney built of cobblestones. There is no reason why a damper cannot be installed at the very top of the chimney and controlled by a chain running down the inside of the chimney. The damper is counter-weighted so it stays open unless the chain is fastened to hold it closed. A tinsmith can make the necessary fitting for the top of the chimney.

Rev. B. Johnson, Nantucket Is., Mass.

The saw blades were no thicker than a coarse thread, and it took an average of 5 hrs. a day for 2 years to complete the project. Did such work for almost 70 yrs., but now take it easy at 78; make an occasional cribbage board for a friend, using 5 or 6 kinds of wood, cut into as many as 300 pieces. Henry Lawrence, Green Bay, Wis.



Dear Mr. Lawrence:

There really is not much we can say, except that few craftsmen nowadays have the time or patience for such a complex, fascinating and beautiful project.

Dear Mr. Hedden:

In a past issue of WORKBENCH noted a tip about covering a hammer head to avoid damaging a surface. I use a rubber furniture tip to slip over a hammer head to do the job. The tips come in various sizes, and four in a package so they last a long time.

Chas. M. Piper, Boone, Iowa.

Dear Mr. Piper:

Thanks for the tip on using furniture tips on the head of a hammer. For the last couple of taps you need to use a nail set and hammer without a covering. The set keeps the hammer head well away from the surface.

Dear Mr. Hedden:

Note in the Nov.-Dec., 1963 issue that Mr. Henry Hartman wanted to know if others were interested in old-fashioned scroll-saw work. Enclosed is a photo of a model of the Eiffel Tower I made from a pattern brought over from France before WW I. There are 91 separate parts in the tower, and I had to cut about 3,500 pieces to get the design. The tower is 20 in. square at the base and is 42 in. high. It has a clock that keeps good time, and miniature lights on each floor.

Dear Mr. Sawyer:

Happy to hear the Wood Carvers are doing well; we get more mail all the time from people interested in the ancient, but modern, art of wood carving. We hope recent articles on wood carving projects in WORKBENCH have met with your approval.

Jay W. Hedden



If you won't buy a good drill—borrow one!

"A ten-dollar drill makes the same size holes as a better drill—why should I pay more?"

That notion has cost a lot of men a good deal of disappointment. If the truth be told, it's wiser to rent a quality drill—or even borrow one from a neighbor—than gamble good money on a "bargain" drill that comes apart at the seams under rough service.

If you're seriously considering buying a drill, it's worth taking the next few minutes to know what makes a good drill worth a few dollars more. For comparison's sake, we'll use the Skil Model 503 quarter-inch drill.

Most Important: The Motor

More than any other single feature, the motor is the key to the quality of a drill... determines whether it will stand up when the going gets stubborn. Working with soft wood isn't much of a problem, even for cheap drills. But in dense woods or materials like steel or masonry, a cheap drill will tend to peter out—and perhaps burnout.

To prevent any such misfortune, the Skil Model 503 is equipped with what is termed a "Super Burnout Protected Motor." That means its windings are coated with

a special high heat resistant resin that prevents overheating. It's an extra production step that costs more to perform—but the life of your drill could depend on it.

Industrial-Quality Parts

Inside the Skil 503 drill are parts—shafts, gears, bearings—made to the same standards—in fact, on the same equipment—as Skil professional drills. Assembly and quality control, too, are every bit as exact as for Skil industrial 1/4" models costing \$65. The Skil 503 is a precision tool, not a stripped-down version made to meet minimum standards.

Even the housing on a Skil Model 503 is something special. It's made of a costly lightweight aluminum alloy that makes the drill easy to work with, but ready for more abuse than you'll ever give it.

Don't Slight Service

When a Skil 1/4" drill leaves our plant it carries a *lifetime* guarantee against defects in material or workmanship. And we back up this guarantee with one of the most extensive nationwide networks of factory authorized serv-

ice centers in the field. Unlike most cheap drills, a Model 503 can be serviced anywhere in a matter of hours or a couple of days. (We know of instances—not too rare—where owners of other makes have waited a month or more while the tool is in repair.)

Think About This

Those are the facts—the rest is up to you. You can buy a cheap drill for something like five or six bucks less than a Skil Model 503. The question is, are you saving five dollars or throwing away ten?

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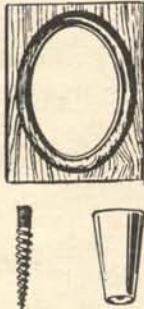
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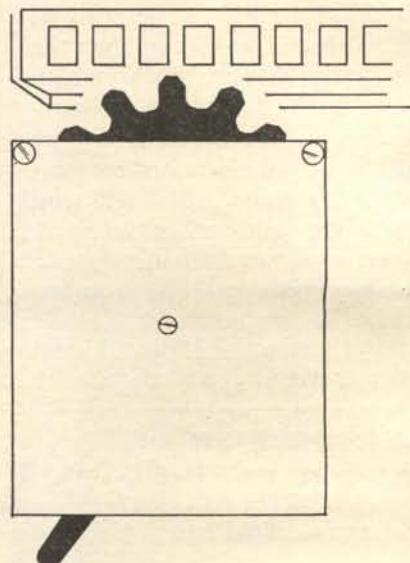
Sliding-Door Closer



gave both to a fellow who had a home with sliding doors, but very little do-it-yourself experience. His first step was to check out the two doors for operating ease. It was necessary to replace some nylon rollers that had been damaged. The name of the door manufacturer was on the units; a visit to the local distributor was made where the rollers were purchased. A 1/4-in. electric drill motor and a couple of drill bits, plus a screw driver were the only tools required to install the closers. Our home owner had no trouble making the installations. The McGraw unit is adjustable, and could be made to close the screen door in a couple of seconds. The final adjustment closes the door about three-fourths of the way quite quickly but smoothly, then slowly closes it the rest of the way.

The ADCO unit for the glass door, see drawing, is installed on the inside of the door. A notched track then is fitted to the top of the door frame. A notched wheel projects from the unit and "drives" the door shut by running on the track. The closer is spring-driven, adjustment of the spring tension determining the closing rate. There is no hesitation, as with a cylinder-type closer, the door closing at a continuous rate.

For information on the McGraw unit: McGraw Mfg. and Distributing Co., 1489 S. Broadway, Denver, Colo. 80210. On the ADCO unit: Sands Mfg. Corp., Box 427, Davenport, Okla. △ △



Automatic closers for hinged doors have been available for many years and most homes have one or more doors fitted with such closers. Until now, however, there have been no such devices for automatically closing sliding doors. Generally called "patio" doors because of their location, the sliding units usually are quite large, and if not in good repair or correct adjustment, can be difficult to open or close.

We have recently tested two automatic closers for sliding doors. One is designed for screen doors, the other for glass doors. Sold by the McGraw Co., the screen-door unit, shown in the photo, incorporates a spring-loaded air cylinder much like the ones used for closers on hinged doors. The cylinder is fastened at the top of the door frame, then connected to a long lever that pivots on a bracket that also is fastened to the top of the frame. The bracket shown in the photo fits on the inside of the horizontal member; there is another type that fits flat on the frame when it does not project enough to accept the other type. The long lever has a fitting on the lower end that slides in a channel that is fastened to the edge of the screen door. It has to slide, as the lever swings in an arc and the relative length changes constantly as the door opens or closes.

Installation is quite simple for either of the units we tested. We

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Zenith Radio Corporation, Dept. 87PR, 6501 W. Grand Avenue, Chicago, Illinois 60635

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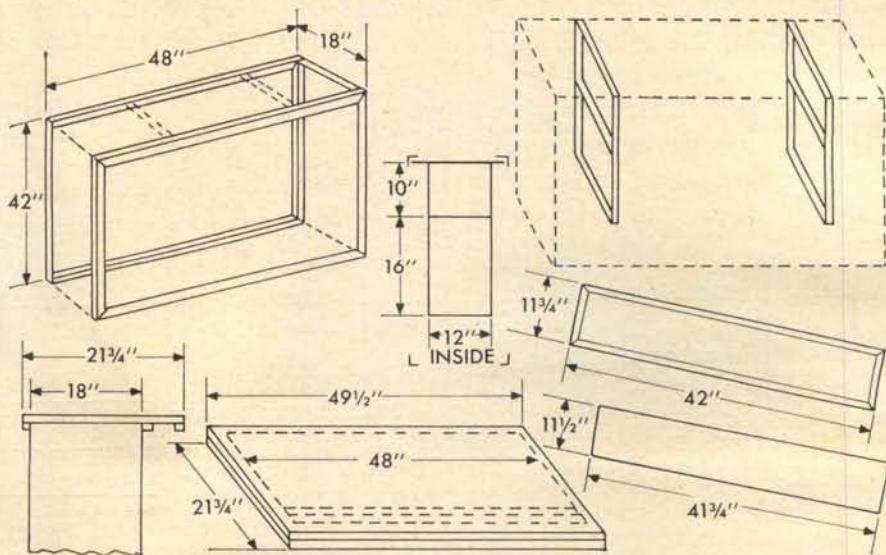
ORNAMENTAL-IRON BAR

JAMES HYEK

Originally designed and built as a refreshment bar, this attractive unit also serves as a room divider and the lady of the house finds it handy as a desk for keeping the household accounts and records.

A small home-type electric welder can handle the required welding. If you do not have a welder, cut and fit the various parts then take

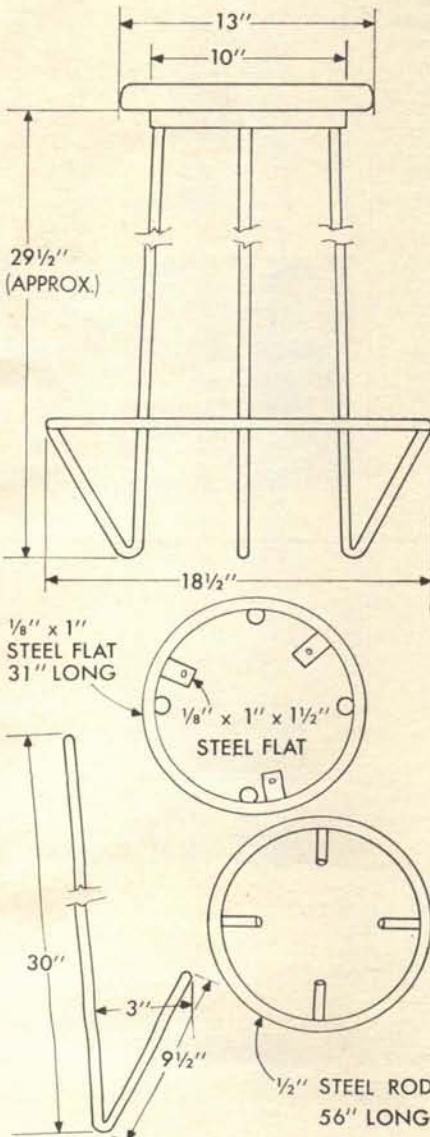
them, and this article, to your local welding shop. Two 15-ft. lengths of $\frac{1}{8}$ x 1 x 1-in. steel angle are cut and notched as indicated for the main frames of the bar. After being welded into rectangles, the frames are joined by butt-welding 16-in. lengths of the angle at each corner. Three pieces of 16-ga. expanded metal are cut to fit loosely inside



BUILD WITH CRAFTPLAN PATTERNS

the frames at the front and two sides and tack-welded in place. Two 64-in. lengths of $\frac{1}{8} \times \frac{3}{4}$ -in. flat steel are bent to U-shapes for the hanging shelves and welded to two cross bars of flat steel that fit between the tops of the bar frame. Two shelf frames are cut and welded from $\frac{1}{8} \times \frac{1}{2} \times \frac{1}{2}$ -in. steel angle and welded between the uprights of the U-shapes. Expanded metal is fitted for the shelves, being left loose so it can be removed for cleaning. Steel flats or curtain rods are fitted inside the bar to accept curtains or drapes your wife will have to fit and sew.

The bar stools are not difficult, but will take some patience, cutting and fitting. The bar top is $\frac{3}{4}$ -in. plywood, and just rests on the frame. The tops of the bar stools are screwed to the stool frames as indicated. Paint all metal flat black, cover the bar top with laminate; the stool tops can be painted or upholstered. $\Delta \Delta$

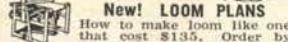


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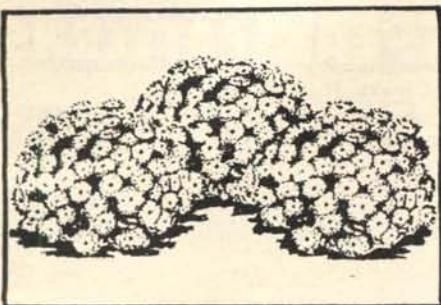
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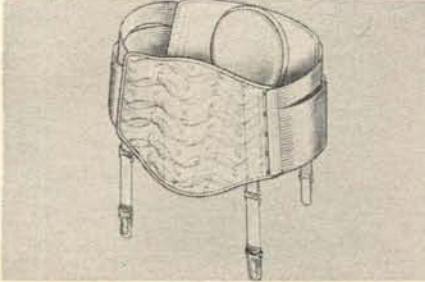
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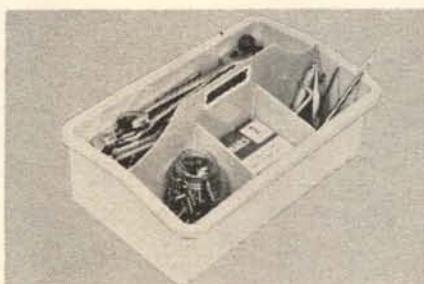
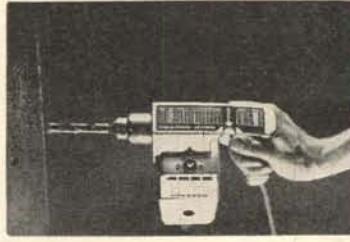
WITH THESE PLASTIC ITEMS you can "thumbtack" objects to perforated hardboard, and just as easily remove them. Perforated hardboard becomes "bulletin board." If you worry about your fingernails, there is a small tool included with each package to aid in removing the "tacks." Available in red, black, white, yellow, clear. Perf-Board Tacks are sold 12 in a package. For more information: Perf-Board Products, Inc., P. O. Box 116, Seal Beach, Calif.



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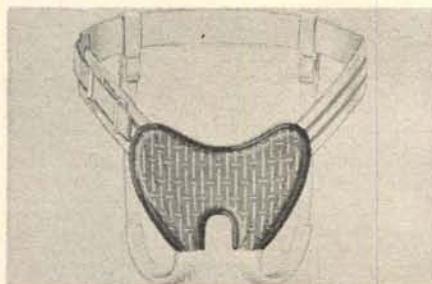


ANY SPEED BETWEEN 600 and 2,000 r.p.m. can be dialed into this $\frac{3}{8}$ -in. drill motor with no loss of power at any speed. The 4.2 amp. hand drill is controlled by special electronic circuit, the motor is protected by resettable thermostat to prevent burnout. Speed changes permit drill to do the work of $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ -in. drills. Dial-A-Power drill motor is made by H. K. Porter Co., Disston Div., Pittsburgh 19, Pa. Available at power-tool dealers.



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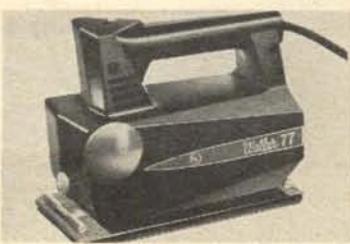
The "Kaddy Carrier" saves time and thousands of extra steps. Weighs only a fraction of wooden tool box yet in super strong plastic. Dividers in three small compartments removable to let tools fit. Order several for workbench, cleaning supplies, sewing kit, car tools or garden supplies. Ideal for use in your trade or business. Immediate delivery. Order now. Only \$2.98 ea. ppd. Money back guaranteed. Roycraft Industries, Dept. WB-3, 226 W. 39th St., Kansas City 11, Mo.



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Showcase



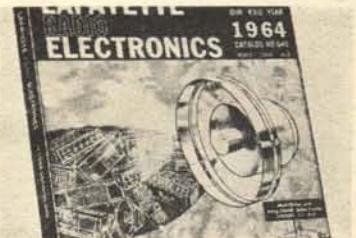
HIGH-POWERED SANDER has low cost, excellent performance. Makes 14,400 strokes per minute of 5/32 in. for fast finishing or material removal. Strokes are in-line for fine finishing. Housing and sanding plate are high-impact plastic; unit is U.L. approved for ungrounded, 2-cord operation. Can be used for wet sanding. \$19.95 at dealers or Weller Electric Corp., 601 Stone's Crossing Rd., Easton, Pa.



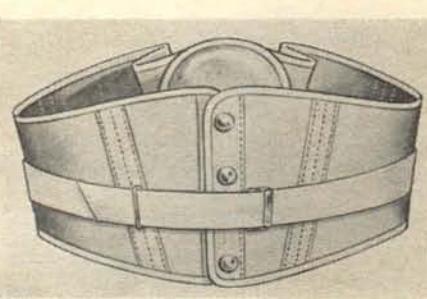
FASTEAST WALLPAPER REMOVER on the market is claim for product called "Fast". Concentrated remover comes in pint and quart-size plastic bottles. When mixed, makes two and four gallons respectively. Non-flammable remover will not injure fabrics, painted surfaces or flooring. An excellent after-wash for removing old paste and grime. At wallpaper, paint and hardware stores. Savogran Co., Box 58, Norwood, Mass.



MEADOW VALLEY RANCHOS, located 1 1/2 miles from Elko, Nevada offer the best features of city and western living. Rancho owners and invited guests fish, boat and picnic at their own private lake. Nevada has no state income, inheritance, corporation or gift tax. Full price of 2 1/2-acre Rancho is \$595. Terms, \$1 down, \$10 per month, or write for free brochures and maps to Meadow Valley Ranchos, 2092A Stockman Bldg., Elko, Nevada.

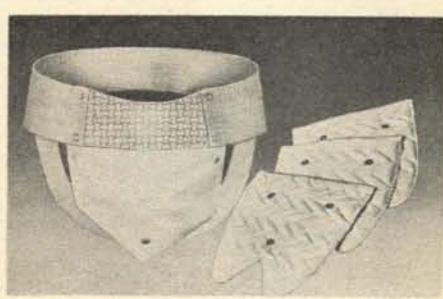


1964 ELECTRONIC CATALOG is largest in 43-year history of this company, with 422 pages, many in color. Items offered include top-quality equipment in both kit and assembled form. Also listed are the latest stereo hi-fi components of all major manufacturers — tuners, amplifiers, pre-amps, turntables, speakers, etc. Catalog No. 640 is free from Lafayette Radio Electronics, P. O. Box 600, Syosset, L. I., New York.



Instant Backache Relief

Pi Peer Back-Easer® relieves back pain, slims waist, improves posture, helps relax tensed nerves. Strong, form-fitting, washable. Snap front. Encircling pull straps for easy adjustment and instant relief. Large foam rubber pad holds, massages back. Prescribed by doctors. No fitting. Send hip measurement. Only \$5.95 postpaid. Satisfaction guaranteed or your money back. Piper Brace Co., Dept. WB-34B, 811 Wyandotte, Kansas City, Mo. 64105.



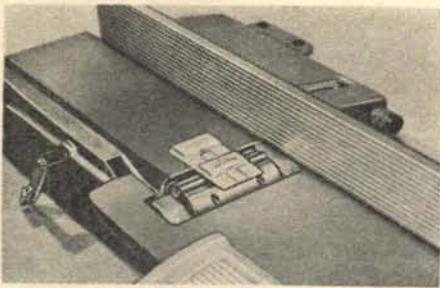
Keep Dry The Masculine Way

Stop embarrassment of wet garments and bedding with Male-Dri, the day-and-night support. Elastic belt, wet-proof pouch. Quilted absorbent reusable cotton pad snaps in, removes for laundering. Ideal in post-operative cases for this condition. Patent pending. \$5.95 ppd. with 3 pads. Boys' sizes available, too. Send measure around waist. Satisfaction guaranteed or money back. Piper Brace Co., Dept. WB-34M, 811 Wyandotte, Kansas City, Mo. 64105.



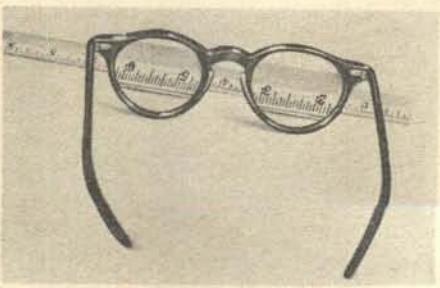
100 Glad Bulbs—\$1.00

Mail by May 15 and get 100 Glad Bulbs for 1¢ a bulb! Michigan Nursery Grown. Rainbow mix reds, yellows, purples, whites, crimson, violet, multicolors, etc., as available. Bulbs are small and with normal soil, care and growing conditions give many blooms this year and grow on to larger bulbs year after year. 200 Glads, \$1.94. C.O.D. postage extra. Cash orders add 35¢ shipped postpaid. Dutch Bulb Imp., Dept. GX-1608, Grand Rapids, Mich. 49502.



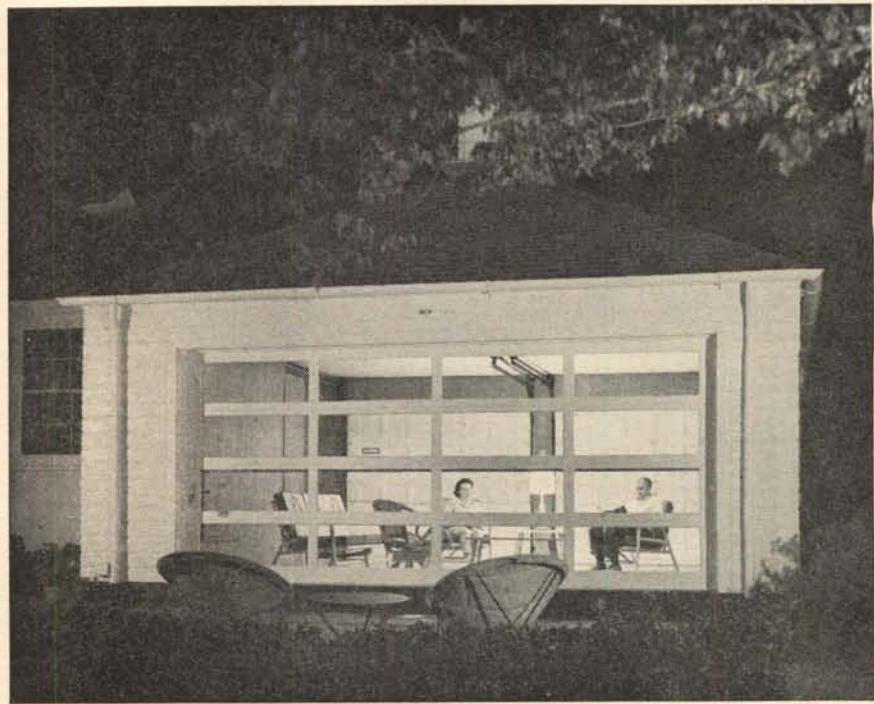
How Are Your Joints?

Magna-Set provides fast, accurate setting of jointer-planer knives—by magnetic force. One magnet holds the tool firmly on rear table; front table is lowered to make knife-locking screws accessible. A second magnet draws each knife into precise position. Model J-7, for setting knives in most 4, 6, 8, and 12-inch jointer-planers, is \$6.50. If not at your dealer, write: Magna-Set Co., Dept. C-1, 632 New Haven Ave., Milford, Conn. 06460



See Clearer Instantly

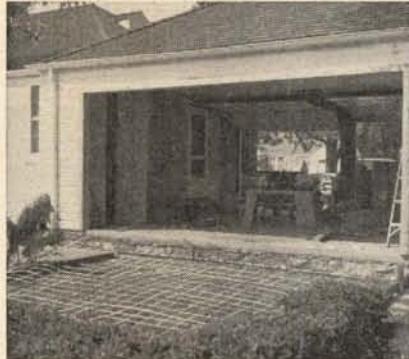
These magnifying reading glasses with high-quality, plano-convex lenses magnify fine print, make it easier to do close, precision work. Stylish smoke-color frames, metal hinges for long wear. Especially helpful for folks over 40 without eye disease or astigmatism. Money-back guarantee if returned postpaid within 30 days. Only \$2.98 for glasses plus 25¢ postage. State age, sex. Nel-King Products, Dept. WB-34G, 811 Wyandotte, Kansas City, Mo. 64105.



Glamorize Your Garage



Before conversion, back of garage had small window, patio stopped short and there was small patch of grass.



After framing for Overhead Door was installed, lawn was excavated for patio extension. Note reinforcing mesh.

What can a garage be besides a place to house your car and store garden equipment? With proper planning and remodeling it can be a covered patio, a recreation room, and a play room for youngsters when cold or rainy weather keeps them indoors. It can serve all these functions and still provide a place for your car in the winter.

Whether your garage is attached to the house—as was our project garage—or is a separate structure, the first step is to cut out the back wall and frame in an opening for a second door. Working in cooperation with the Overhead Door Company we first determined the size of the glass-paneled door that was required, (15 ft. wide and 4 panels



As soon as concrete of patio extension had set up, alkali-resistant vinyl paint was applied. It has five-year guarantee.



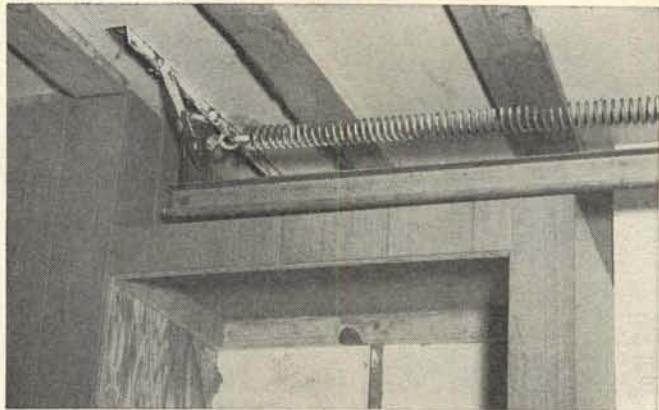
Shot from outside after door was installed in back wall of garage shows how attractive it is.



After-dark photo shows that cars can be garaged—also riding mower—after building has been glamorized.



Before conversion, south wall, (adjacent to house), had handy cabinets, but was cluttered and not attractive.



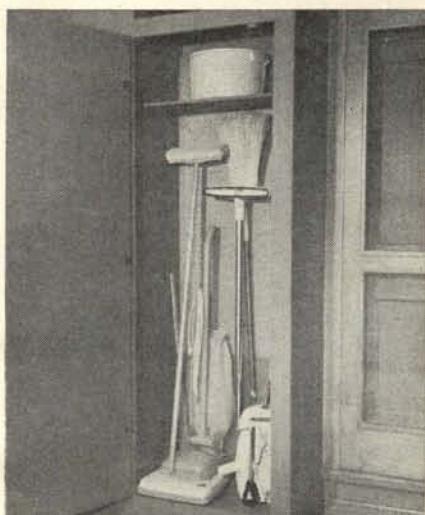
Question often asked, "What can you do about building cabinets when the door track interferes?" is answered here.

high), and the opening for that size door. A double 2 x 8 was used for a header; it was supported on double 2 x 4s at each end. The rough opening then was trimmed with 1-in. stock.

We also determined from the Overhead Door Company where the

brackets for supporting the door tracks would be located. This was necessary, as a ceiling tile had to be left out at each bracket location when the ceiling was installed. We did not intend to install the door ourselves; we bought the door at the "as installed" price. There was

very little difference in the cost of a door we had to install, and the complete price, with installation, of the Overhead Door. Aligning the door tracks and adjusting the very heavy springs was a job we were glad to leave to professionals, especially after seeing the actual



After paneling was installed, owner fitted perforated hardboard in the back of all cabinets for efficient storage.



Royalcoate paneling is installed with finishing nails that are countersunk, the heads hidden by colored putty.



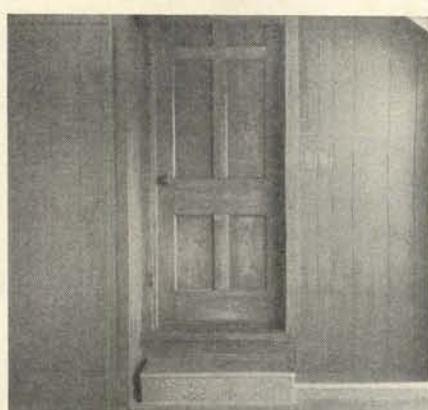
Ceiling cove finishes joint between wall paneling and ceiling tile; is one of the last jobs done during remodeling.



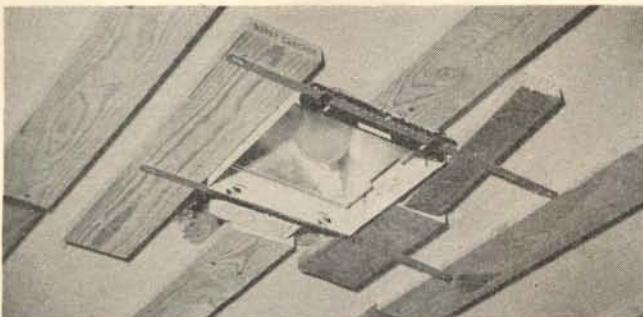
After floor tile has been installed, shoe molding is nailed along joint between wall paneling and floor.



Vinyl-asbestos tile can be shaped around curved surfaces, even bent at right angles as here, if it is heated.



Previously door into house was painted. It was stripped, then stained and "antiqued". Note corner molding on tile.



Bulbs in porcelain sockets were replaced with lights flush in ceiling. Here box is attached to furring strips on ceiling.



After ceiling tile is all installed, frosted-glass covers fit over the light boxes, make a neat, attractive installation.

installation being done.

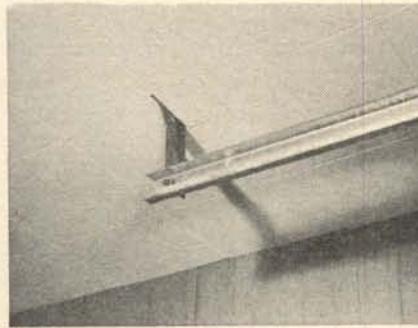
After framing in the door opening in the back wall, we excavated for an extension to an existing patio so it would run across the area behind the garage. We suggest such a patio for every garage remodeling of this kind. Scaling paint on the old patio was stripped off, then it and the new section were coated with an alkali-resistant vinyl paint that is guaranteed for five years. The color chosen was charcoal, there are several colors available.

Back inside the garage, the two bulbs in porcelain sockets were replaced with flush lights. The boxes were installed while furring strips for the ceiling tile were installed. When attaching the ceiling tile it also was necessary to fit around the brackets for the existing Overhead Doors. In the garage remodeled there were two doors in the front of the garage, as shown in several of the photos.

The walls now were stripped of all extraneous pieces of material, (your garage may have bare studs), and Masonite Royalcote paneling was installed. The paneling was fitted right over the doors of existing built-in cabinets. Additional cabinets also could be built at this time. Door tracks are no problem;



As ceiling tile is installed, openings are left around door-track brackets, with furring strip remaining on two sides.



Final step is to fit small piece in opening that is left; score is made in single piece to match edges of tiles.



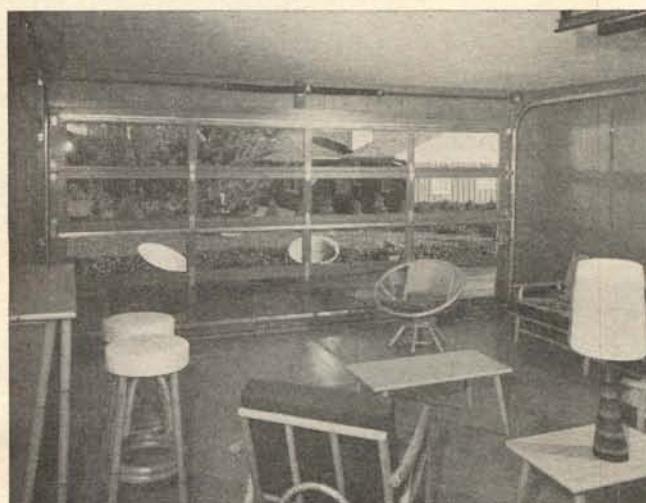
In this "before" photo, north wall has "wainscoating" as protection against cars, floor is stained and quite ugly.



This is shot of the back wall in which new Overhead Door was installed. Also note bare bulb in plain porcelain socket.



Looking out through newly-installed Overhead Door to patio shows how it adds to visual size of the garage-room.



Same as previous view, but with door closed. Note that glass-paneled door allows sunlight to illuminate room.

the cabinet simply is built under them, as is shown in one of the photos. Fitting perforated hardboard in the backs of the cabinets permitted more efficient storage.

During the job the door leading from the garage into the house was stripped of its old paint, then stained and "antiqued" so it was compatible with the walnut grain and color of the wall paneling.

When most of the work was done, the floor was swept and carefully cleaned then vinyl asbestos tile was laid. This tile can be heated to soften it so it will fit around curves and even right angles. At sharp

corners, as at the step to the door, metal corner trim was used. Pre-finished trim now was installed between the ceiling and walls and between the floor and walls. This pre-finished molding is available to match each color of paneling in the Masonite Royalcote line.

The existing doors at the front of the garage were given a fresh coat of paint inside and out and the door tracks were wire-brushed and painted. The frame around the opening for the new door at the back of the garage was primed, then given a finish coat. The job was ready for the installation of

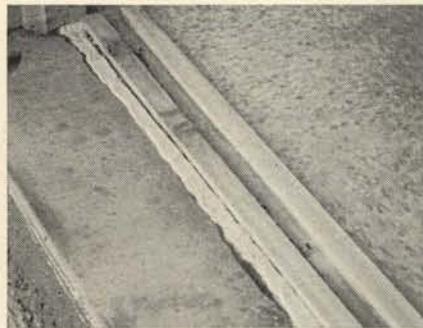
the new Overhead Door.

The first step was to seal the concrete under the location of the threshold with a vinyl paint. Holes then were drilled and screw anchors installed to align with holes in the aluminum threshold. Strips of wood are positioned to provide additional support in the event heavy loads are run over it—such as an automobile, then strips of calking are laid down and the threshold is installed.

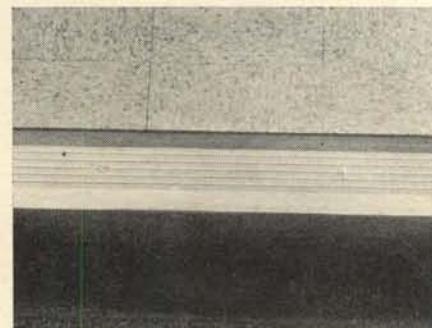
The first section of the door now is positioned and leveled. It is trimmed as necessary to make its upper edge perfectly level. With the



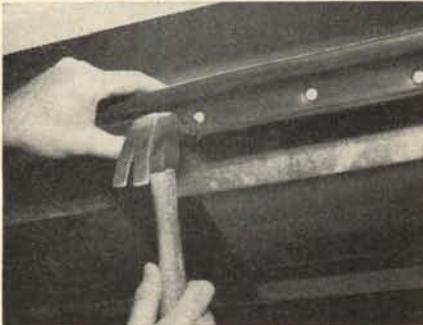
Professional door installer begins job by sealing concrete under the location of the sill on which door closes.



Holes are drilled and screw anchors fitted, then wood strips are fitted on ribbons of calking to assure seal.



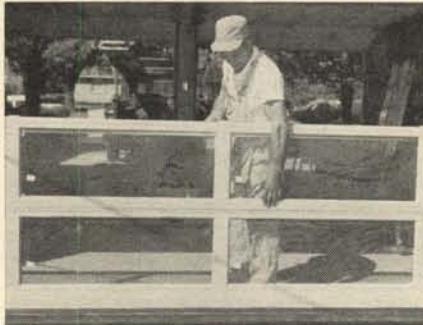
Aluminum sill, or threshold, is screwed to floor over wood strips and calking. Sill assures weathertight seal.



On lower edge of door itself a rubber gasket is nailed. This is forced down on aluminum sill when door is closed.



Installer's first step is to place lower door panel in opening and level it exactly. It is trimmed to fit.



Once lower door panel is leveled, other panels can be stacked on it. Tracks are fitted loosely on ends of panels.



After last, top, panel is fitted in place, tracks are adjusted so that assembled door fits snugly against frame.



With door fitted properly, tracks are bolted to wall, and hung from brackets attached to ceiling. This is critical step.



Springs, shafts and other mechanism are installed and adjusted, then door is checked for smooth, easy operation.



Looking through front doors of garage with back door closed; notice how glass panels illuminate room.

With back door open there is a constant breeze blowing through the room; this "natural air conditioning" is free.

first section level, the other panels are "stacked" one on top of the other and the hardware fitted. With all panels joined, the tracks are positioned and attached to the wall, and to the overhead brackets. The springs and other mechanism now are installed and adjusted and weatherstripping attached. No final adjustment is made until the door is primed and painted. The added weight of the paint can make a difference in the operation of the door, such doors being that finely balanced.

You now have a beautiful room and adjoining patio. With front and back doors open there is a fine breeze. With both doors closed you have a room illuminated by sunlight, fine for rainy days.

Wives may object to allowing the car back in, but "soaker" pads under the engine will prevent oil stains on the floor, and the cars are kept in only at night. An auxiliary heating plant may be necessary, as most garages are not heated. If your garage has only bare studs, it would be a good idea



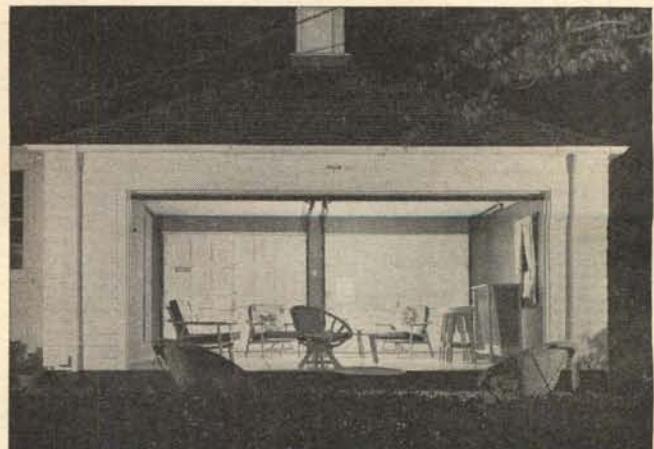
to install insulation before nailing up the wall paneling and the ceiling tile.

Examine the photos of the various steps in the remodeling, and note

where you can apply a similar idea to your own garage. The walls and roof are there, all you have to do is keep the car out and "Glamorize" that garage. △ △

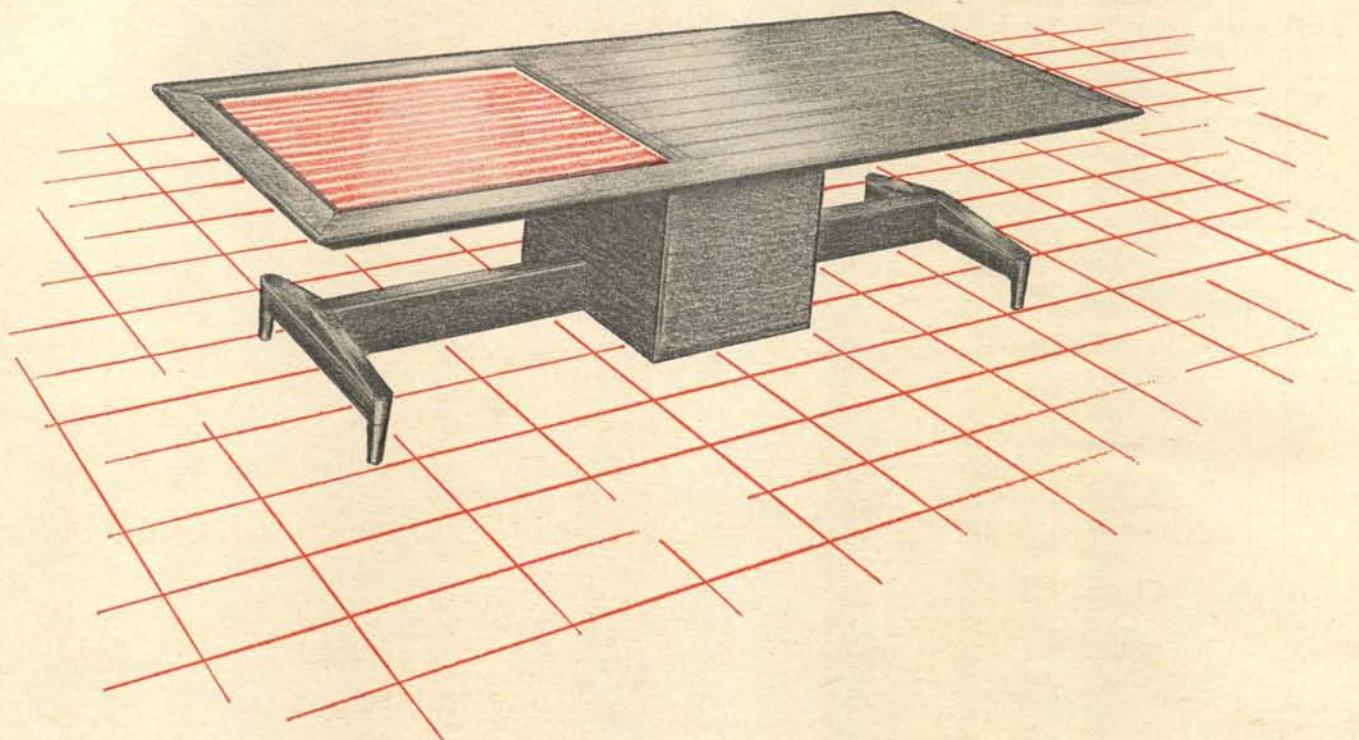


Front of garage is in no way changed by conversion of garage into family room. Fresh coat of paint was applied.



After-dark look into room shows how attractive it is for night-time entertaining; casual summertime living.

CONTEMPORARY COFFEE TABLE



Intriguing as well as attractive is the design of this coffee table that complements the chair and sofa in the living-room suite of the **WORKBENCH** Contemporary Collection. Don W. Cartner Associates has given us a two-for-one item in the table, as it has a hidden storage compartment in the base that is reached by sliding back a "hatch" assembled from tongue-and-groove strips of hardwood. When the hatch is pulled back it also exposes a surface covered with white plastic laminate, (Formica, Micarta, Textolite, etc.), on which food and beverages can be served. The laminate makes an easy-to-clean surface, as does the polished glass recessed into the other end of the table top. Under the glass is a rectangle of plywood on which is fitted a piece of upholstery material to match that used on the chair and divan described in previous issues. Changing the upholstery material will give the table an entirely new look, as is the case with the slip-on sheathes used on the chair and divan.

Construction of the table is not difficult, but there are quite a number of pieces to be cut and fitted. This means close attention to dimensions, and accurate cutting of miters and corners. Start construction by making the base, Fig. 1, that consists of the notched longitudinal piece, the two cross members and the five legs, all hardwood solid stock.

The storage compartment, Figs. 1 and 3, is next. All but the glue blocks are cut from $\frac{3}{4}$ -in. hardwood plywood. The two side panels, Fig. 3, are the same size, and the end panels are a matching pair, except that one end panel has a dado cut in it to accept the glass-and-cup rack. The vertical edges of the four pieces are mitered at 45 deg. On the inside, lower edge of each of the four pieces cut a $\frac{1}{8}$ x $\frac{3}{4}$ -in. rabbet. A $\frac{3}{4}$ x $1\frac{1}{8}$ -in. notch is cut in the lower edge of the two end panels to accept the longitudinal member of the base. On the outside, upper edge of each piece cut

a $\frac{3}{8}$ x $1\frac{1}{8}$ -in. rabbet. Two pieces of the $\frac{3}{4}$ -in. hardwood plywood are cut $5\frac{3}{16}$ x $11\frac{3}{4}$ in. to make the bottom. An opening $1\frac{1}{8}$ in. wide is left between the two pieces to accommodate the longitudinal of the base. Use glue, plus two screws driven through each end panel into the longitudinal to fasten the base and storage compartment together. A glue block now is glued and screwed on the centerline of the outside of each end panel, its upper edge flush with the lower edge of the rabbet.

The table-top frame, Fig. 2, is next. It is cut from $\frac{3}{4}$ x $1\frac{1}{8}$ -in. hardwood strips, with the wider dimension horizontal. Two crosspieces are fitted in the frame, being spaced $5\frac{1}{8}$ in. on each side of center to produce an opening $11\frac{1}{4}$ in. wide. Tenons $\frac{1}{2}$ x $\frac{1}{2}$ in. are cut on the ends of these pieces to fit notches in the frame sides. The length of the crosspieces is determined by measuring between the sides of the assembled frame. A rabbet $\frac{3}{8}$ in. deep and $\frac{1}{2}$ in. wide is cut in three sides of the assembled frame, as indicated. In the end member of the frame, the one not rabbeted, cut a notch $\frac{3}{4}$ x 6 in. for a hand grip. This notch permits grasping the edge of the hatch assembly to pull it out. Over the assembled frame is fitted a piece of $\frac{1}{4}$ -in. plywood measuring 17 x $56\frac{1}{2}$ in. The end of the plywood is positioned flush with the end of the frame not rabbeted, and allowed to project $\frac{1}{2}$ in. beyond the frame at the other end. It also projects $\frac{1}{2}$ in. at each side. Mark on the plywood the $11\frac{1}{4}$ x $12\frac{3}{4}$ -in. opening between the cross-pieces of the frame, and cut this opening in the plywood. Glue and brad the plywood to the frame. Now, cut a piece of $\frac{1}{8}$ -in. plastic laminate 17 x $34\frac{1}{4}$ in. Place it on the plywood as indicated, Fig. 2, and mark the opening. Cut out the opening then cement the laminate to the plywood with contact adhesive. Attach the top assembly to the storage compartment by driving screws up through the glue blocks

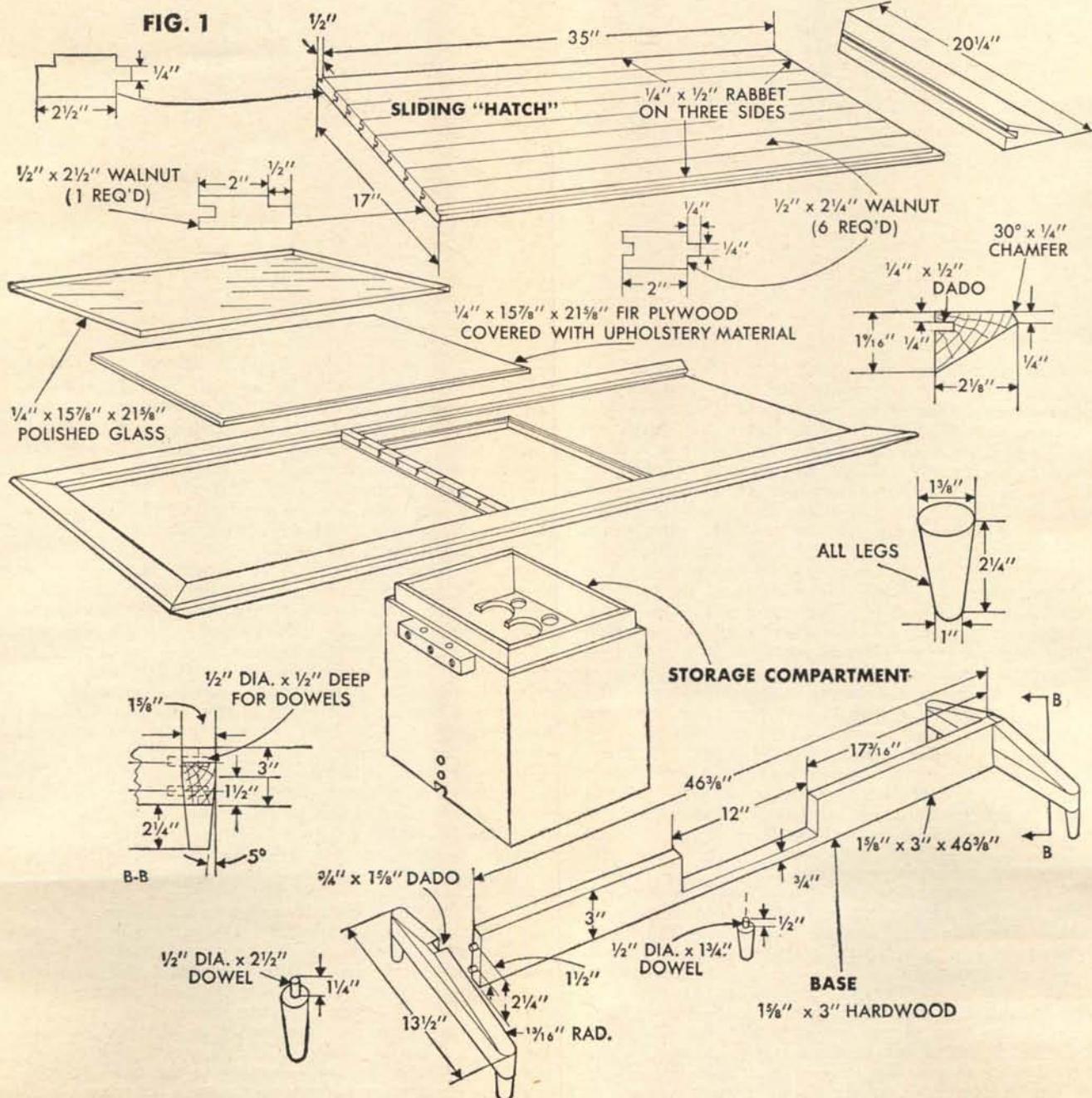
into the crosspieces of the top frame. Also use glue on contacting surfaces.

The edge molding for the top is next. On three sides the molding is shaped as in Fig. 2. Use clear, straight-grained hardwood. The molding can be shaped on a table saw or radial-arm saw as all surfaces are flat. Fit and miter the molding to the three edges of the top, then make the sliding hatch, Fig. 1. The hatch consists of strips of $\frac{1}{2}$ -in. walnut or other hardwood. Six of the strips are $2\frac{1}{4}$ in. wide, a $\frac{1}{4} \times \frac{1}{4}$ -in. tongue being cut on one edge, a $\frac{1}{4} \times \frac{1}{4}$ -in. groove being cut on the other. One strip is $2\frac{1}{2}$ in. wide—it fits one edge—and has a groove cut in one of its edges, and a rabbet in the other. The strip for the opposite edge of the hatch is $2\frac{3}{4}$ in. wide, with a $\frac{1}{4} \times \frac{1}{4}$ -in. tongue on one edge, a $\frac{1}{4} \times \frac{1}{2}$ -in. rabbet on the other. After the hatch assembly is glued, clamped and allowed to set, a $\frac{1}{4} \times \frac{1}{2}$ -in. rabbet is cut on one end, as indicated,

to match the rabbets on the other two edges. A 1-in. strip now is cut from the square end of the 35-in.-long hatch. The strip is drilled for dowels, Fig. 2, as is the top. The holes in the top go through the laminate and the $\frac{1}{4}$ -in. plywood. Glue the strip to the top assembly.

A piece of molding, shaped as indicated in Fig. 1, now is fitted on the rabbeted end of the hatch. Fasten it with glue and finishing nails or screws. Cut the hatch to a length that permits the end to butt against the 1-in. strip, with just a slight clearance between the inside edge of the molding and the top assembly. The U-shape spacer frame of $\frac{1}{8} \times \frac{1}{2}$ -in. wood now is made and placed inside the molding. Upholstery material is wrapped and tacked on a piece of $\frac{1}{4}$ -in. plywood and fitted on the spacer. Over this is placed a piece of polished plate glass. Remove the glass and upholstery when staining and finishing the completed table. $\triangle \triangle$

FIG. 1



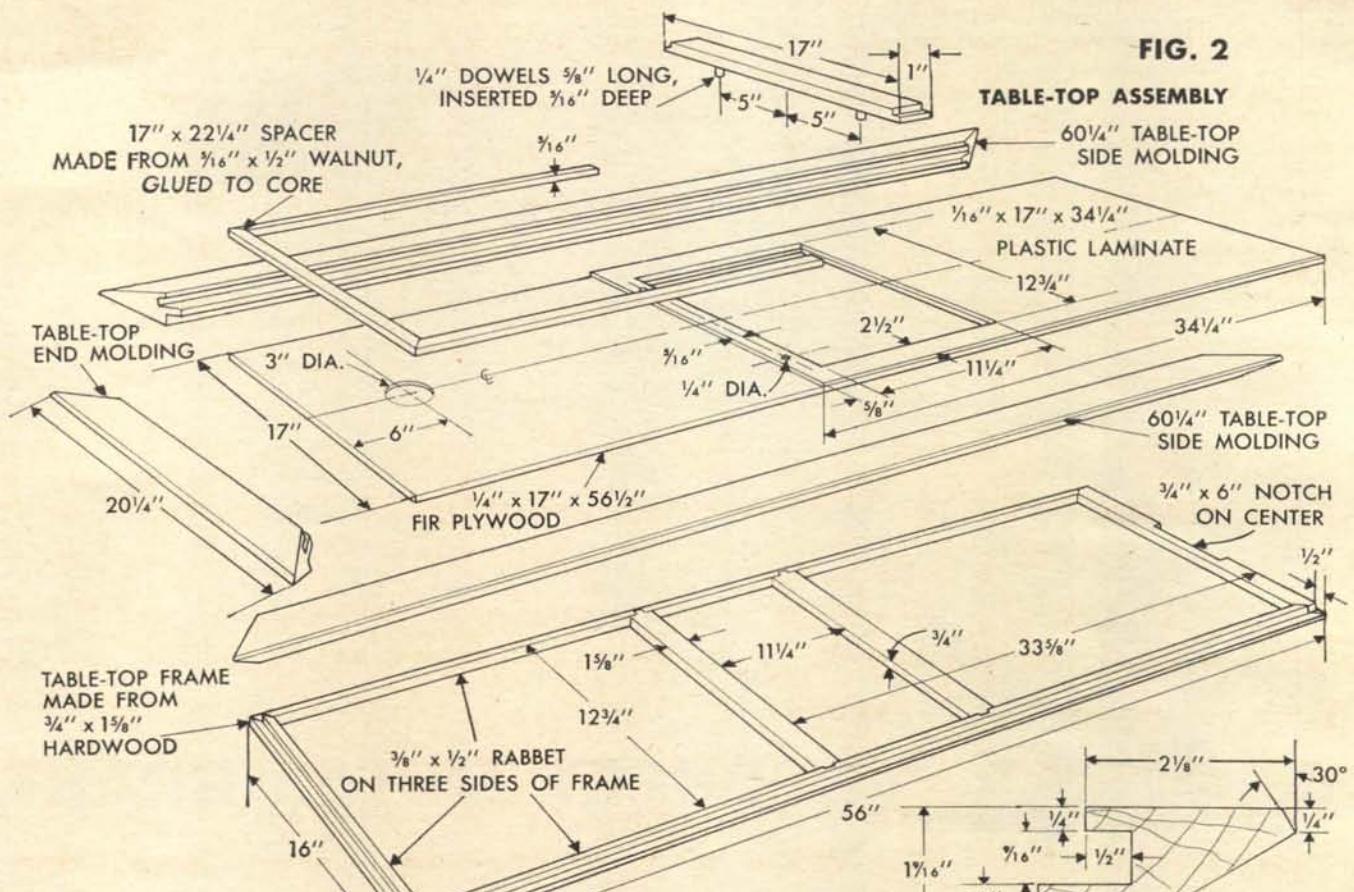
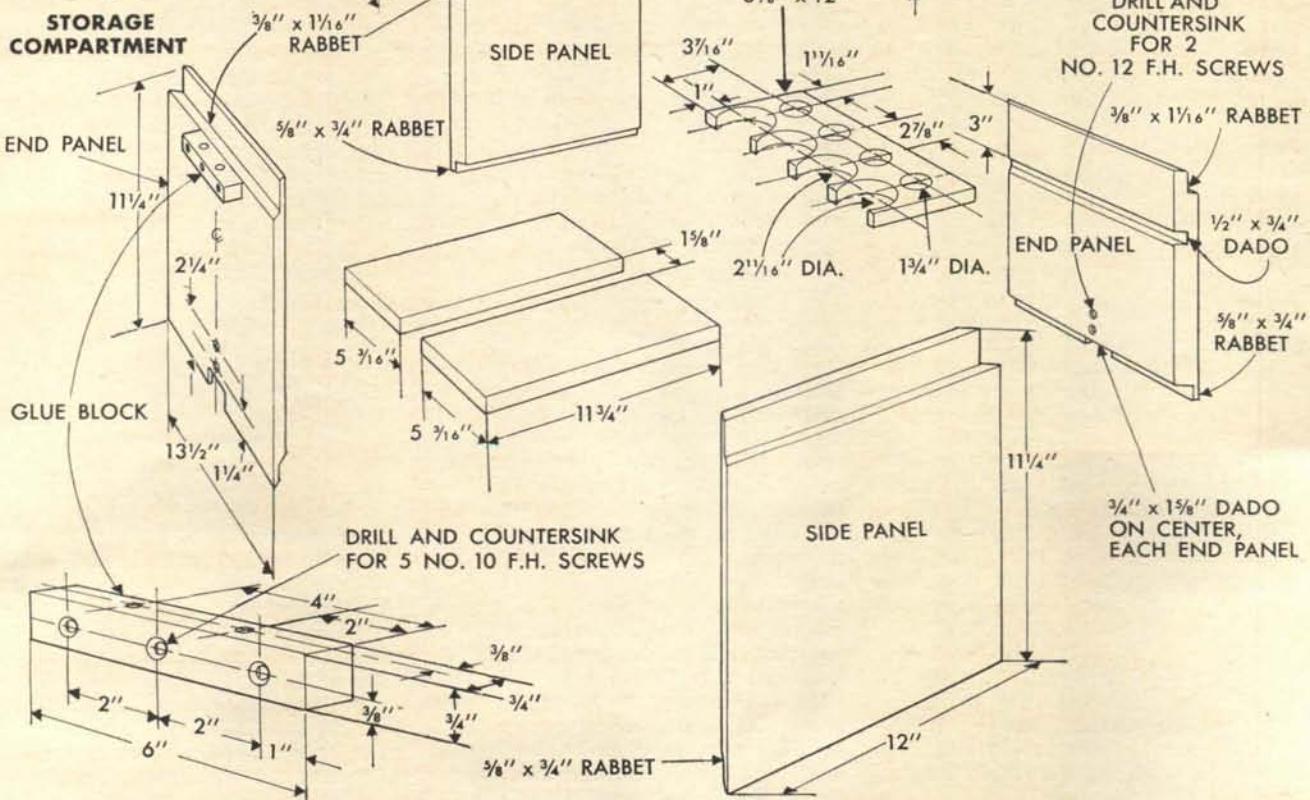


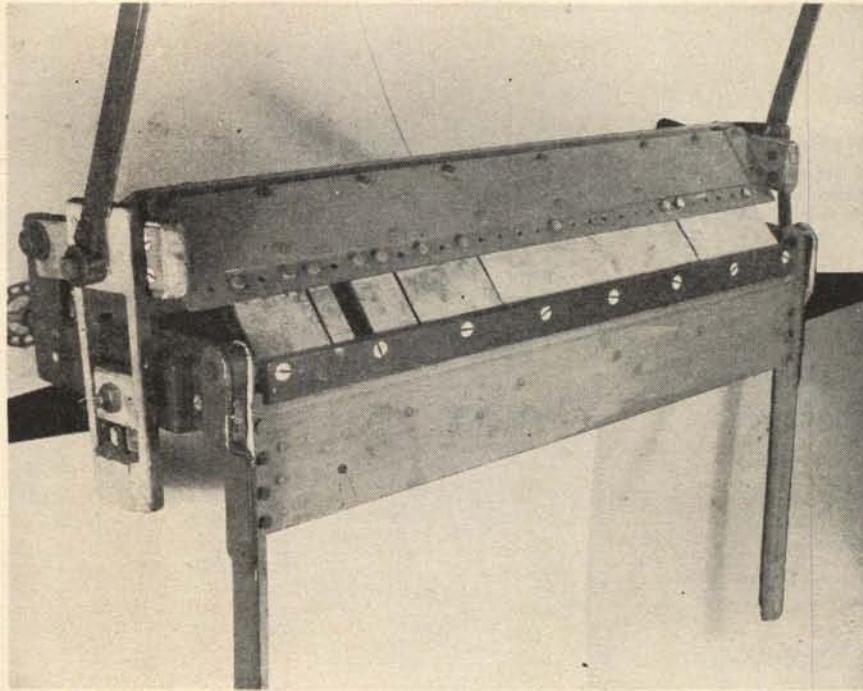
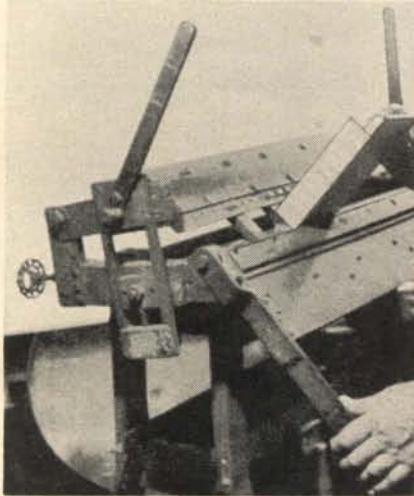
FIG. 3

**STORAGE
COMPARTMENT**



1. Complete brake, shown without stand. Note various size "fingers" for bending boxes.

2. Advantage of individual fingers is shown here, where ends of metal box are being bent without any problem.



SHEET METAL BRAKE

JOHN STEINKE

Capacity of this brake is sheet metal up to 18 ga., in widths to 30 in., Fig. 1. In addition, Fig. 2, it will bend pans, boxes and make closed ends without distortion up to 2 in. deep. Lengthening the hold-down "fingers" to 6 in. will permit pan brakes to 3 in. deep.

Construction is in sub-assemblies, starting with the bed, Fig. 6. It is made from a piece of $\frac{1}{8}$ -in. sheet steel, the front corners being notched $\frac{1}{2} \times \frac{1}{2}$ in. At each end an angle is clamped to the underside and a hole drilled through the center of the angle, through the bed plate. Countersink this hole, and all holes in the bed assembly, for flathead bolts. Tighten the bolt in each angle, then remove the clamps. Fit the angle at the back edge as shown, clamp it in place and drill a hole near each end so it will pass through the bed plate and the end angles. Bolt it in place. Fit the front angle in place and drill holes in its ends so the end angles also will be held with the same bolts. The front angle is raised above the bed by a $\frac{1}{2}$ -in. spacer. The spacer can be hard-wood if metal is not available. Five bolts are used in the front angle, and in the back angle.

The pivot plate of the bed has a "key point," Detail A, Fig. 6. After cutting the plate to shape from steel plate or bar stock, (2 req'd), drill the $\frac{1}{2}$ -in. hole for the pivot pin. Cut the pivot pins, then accurately prick-punch the centers of the pins. Fit the pins in the pivot plates, then locate each so the punch mark is exactly at the front, upper corner of the front angle of the bed, as in Detail A, Fig. 6. Clamp the pivot plates in position, then drill and countersink for $\frac{1}{4}$ -in. flathead bolts. The holes are run through the end angles of the bed. Before installing the pivot plate, drill the 3-in.-deep hole in the back edge, and the $\frac{1}{2}$ -in. hole through the side of the plate near the back as indicated. These are for the 5/16-in. nut and threaded rod that are installed later. Bolt the pivot plates to the bed angles.

The bending leaf is next. It is made from a piece of $\frac{1}{8}$ -in. plate, the upper corners being notched as shown. An 18-in. length of angle now is riveted or bolted to each end, Fig. 6. At the upper edge a $\frac{1}{8}$ -in. steel flat is bolted or riveted, to produce an edge $\frac{1}{4}$ -in. wide. The steel flat then is drilled and tapped to hold a $\frac{1}{4}$ -in. steel flat, Figs. 5

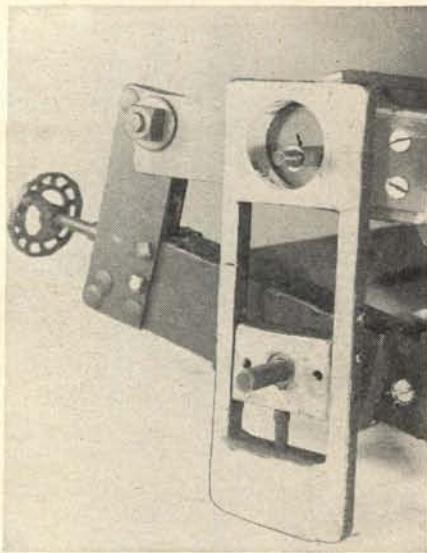
and 6. The latter is removed only to make narrow reverse bends. For heavier gauge metals, and to make radius bends, an optional angle, Detail A, Fig. 6, can be added when needed. The handles for the bending leaf are bolted—or welded—from two lengths of steel flat. One is offset as shown, Fig. 6, to fit over the pivot plate.

The bending leaf with its two angles now is clamped to the bed with its upper edge flush with the front bed angle. The two handles are fitted to the pivot plates with the pins. Clamp the handles and bending leaf, then drill through handles and angles for bolts. The assembly also can be welded.

(The drawings and photos will not always agree, as the brake made 15 years ago and in constant use in a job shop, will be improved by the changes shown in the drawings. Where welding can be done, this method of assembly will save time and make a more rigid unit. Bolts can be almost eliminated if welding is used.)

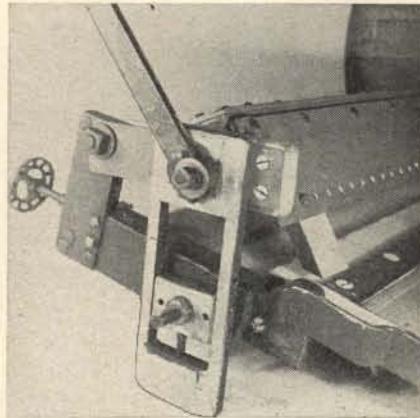
At this time a reinforcing angle is fastened to the "underside" of the bending leaf, it being positioned to clear the lower edge of the bed.

The hold-down assembly, Fig. 6,

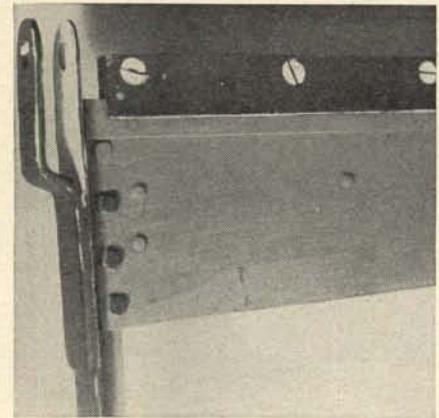


3. Partly disassembled eccentric unit shows how disk raises and lowers holding fingers. Note that bolt is sleeved.

clamps metal to the bed, and has vertical and horizontal movements controlled by the eccentric units at the ends. The hold-down is made from two large angles, (the original has lighter angles reinforced with



4. Here lever is back, rotating eccentric disk so holding fingers are raised. Metal then can be inserted under fingers.



5. Bending leaf and handle construction; leaf is notched $1/2 \times 3/4$ in. at each upper corner, requires notching of flats.

plate), fastened together as indicated so that the $1/2$ -in. "fingers" can be inserted. The angle assembly then is fastened to the shorter angles at the ends. In the original, and in the upper drawing, Fig. 6, the end angles are on the underside of the hold-down angles. This makes a neater assembly, but

having the short angles outside, as in the lower, left hand drawing, Fig. 6, makes the assembly easier.

The fingers can be made individually, but the best method is to first cut a bevel on a bar of $1/2 \times 4$ -in. stock that is slightly longer than the brake bed, to allow for saw cuts and extra fingers. On

FIG. 6

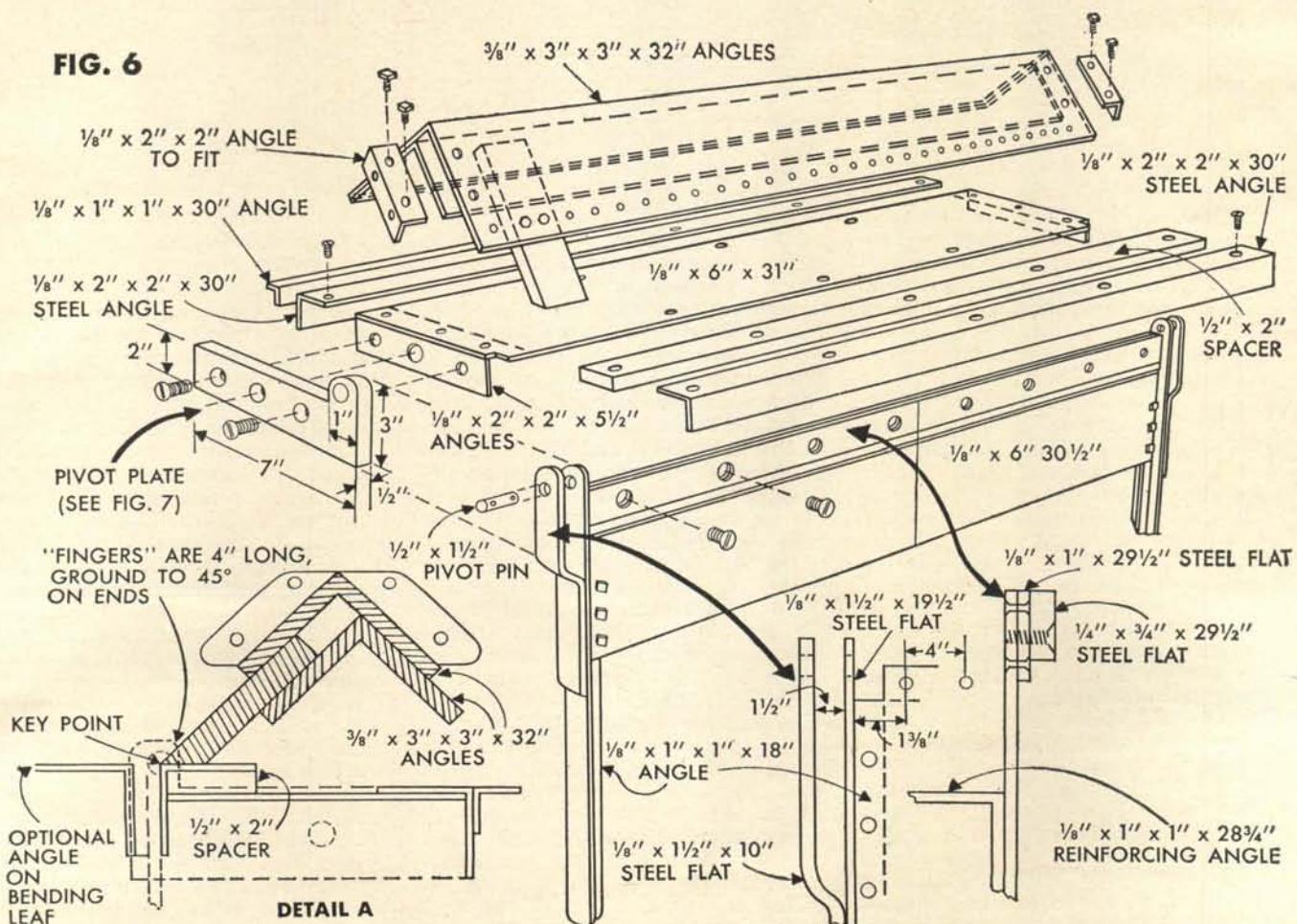
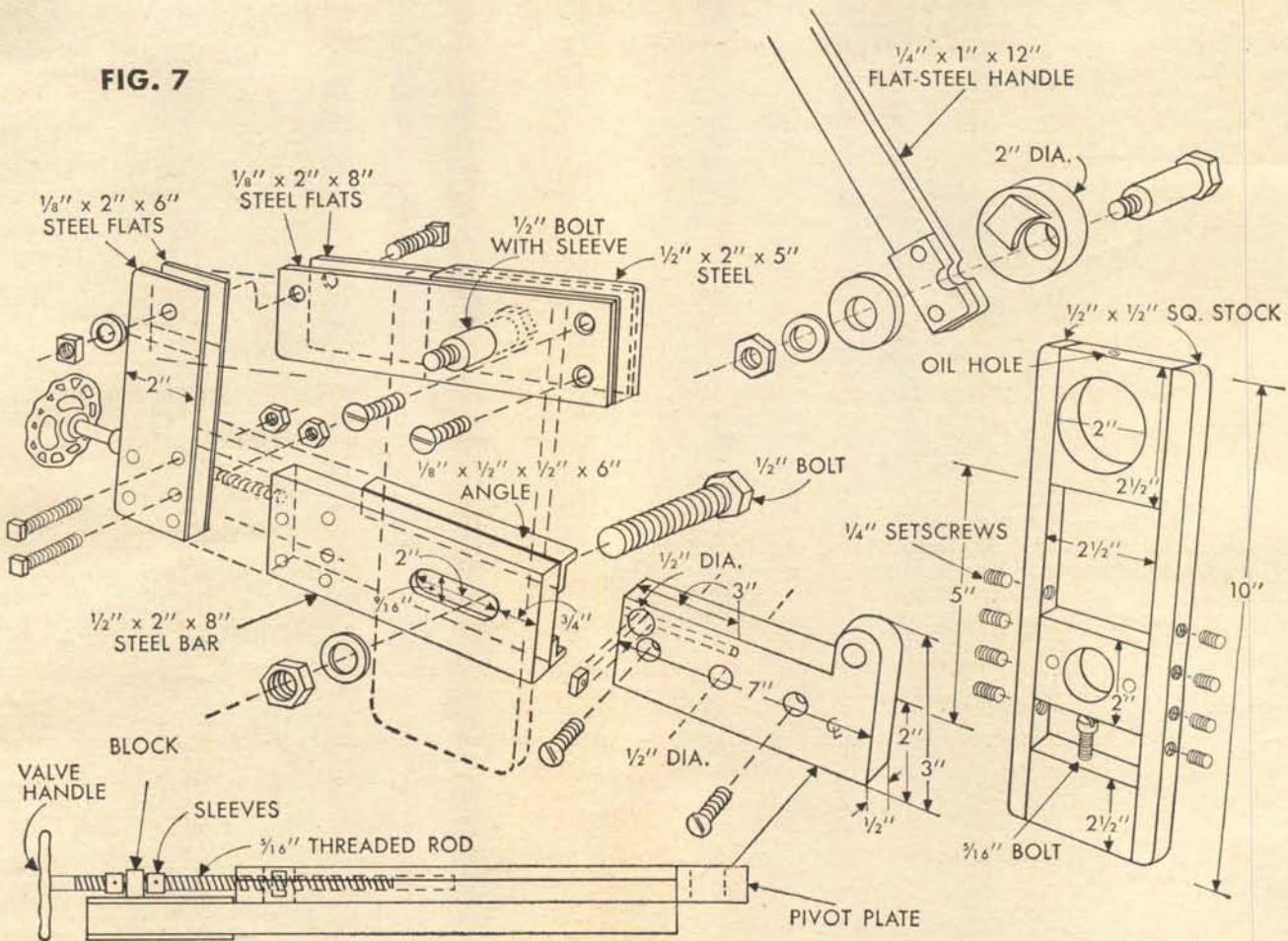


FIG. 7



the original the bevel was carefully ground and filed by hand; a machine shop should mill the bevel, and cut the fingers in a short time at nominal cost. A good selection of finger widths is 1, 1½, 2, 3, 4, 6 and 12 in. Do not install the fingers at this time.

The brake-clamp assembly, Fig. 7, consists of two sub-assemblies; one is a sliding frame that attaches to the hold-down and moves along the pivot plate, the other is eccentric block. The sliding unit consists of a steel plate to which small angles are attached; these latter slide along the pivot block. A slot in the plate provides clearance for the lower pivot pin. At the back of the plate are fitted two flats vertically. At the upper ends of these flats is fitted a spacer block. Outside the flats and spacer are fitted two more flats, pivoted as indicated. A spacer is fitted between the pivoting flats near the front ends. Through the flats and the spacer a hole is drilled to accept a $\frac{1}{2}$ -in. bolt fitted with a sleeve.

The complete sliding assembly is moved back and forth by means of a threaded rod that turns in the

nut fitted in the hole near the rear of the pivot block. An 8-in. length of the rod is passed through a steel block attached to the vertical of the sliding assembly, lower left, Fig. 7. Two short sleeves are pinned to the rod on either side of the block. The end of the rod is filed square and fitted with a valve handle. Turn the rod almost all the way in, then fit the hold-down with its fingers in place so the fingers are just on the edge of the front angle of the bed. Clamp the pivoting members of the slide assemblies to the end angles of the hold-down assembly and weld them in place, or drill and bolt them. At this time also drill through the hold-down angles and the fingers with a tap drill for 5/16-in. bolts. Remove the fingers and drill clearance holes for the 5/16-in. bolts. Also drill out the holes in the upper angle of the hold-down. Tap the lower angle for 5/16-in. bolts. Holes in the angles should be spaced 1 in. apart, as should the hole in the fingers. Center the holes $\frac{1}{2}$ in. from one edge so all fingers are interchangeable.

The eccentric block, Figs. 3, 4 and 7, can be made in several

pieces, or flame-cut from plate, as was the original. A 2-in. disk is turned to a snug, sliding fit in a 2-in. hole in the upper part of the eccentric block and a $\frac{1}{2}$ -in. hole is drilled off-center in it. The eccentric block is bolted to the brake and the hold-down fingers are held firmly down on the bed. A handle now is bolted or welded to the disk, positioned so it slants slightly toward the operator. Moving the handles back will raise the hold-down fingers. When thicker metal is bent, the fingers are raised by adjusting the screw in the lower block of the eccentric assembly. The sliding block in the eccentric assembly is held in position, after adjustment, by several setscrews as indicated.

With assembly of the brake complete, check all working parts and adjust as necessary. The eccentric block should hold the sliding frame snugly, yet allow it to move back and forth for adjustment.

In use the brake is clamped or bolted to a bench or stand with its forward edge projecting to clear the reinforcing angle on the bending leaf. △△



CLAVICHORD

PAUL BRANDT



Simplest and smallest of keyboard instruments, the clavichord is most sensitive in musical expression. Its music has been characterized as "angelic," probably because of its soft, but silvery tones.

The earliest known references to the clavichord date it to the fourteenth century, and it has enjoyed generally good reception in Europe in the intervening years. The best known exponent of the clavichord was Johann Sebastian Bach, who "liked best to play upon the clavichord. He considered the clavichord to be the best instrument for study, and, in general, for private musical entertainment. He found it the most convenient for the expression of his most refined thoughts" . . . Johann Nicolaus Forkel.

The popularity of the clavichord began to wane about the time of the French Revolution, when the development of the pianoforte, (piano), permitted a performer to play the very softest sounds, (piano), to the loudest, (forte), on one instrument. However,

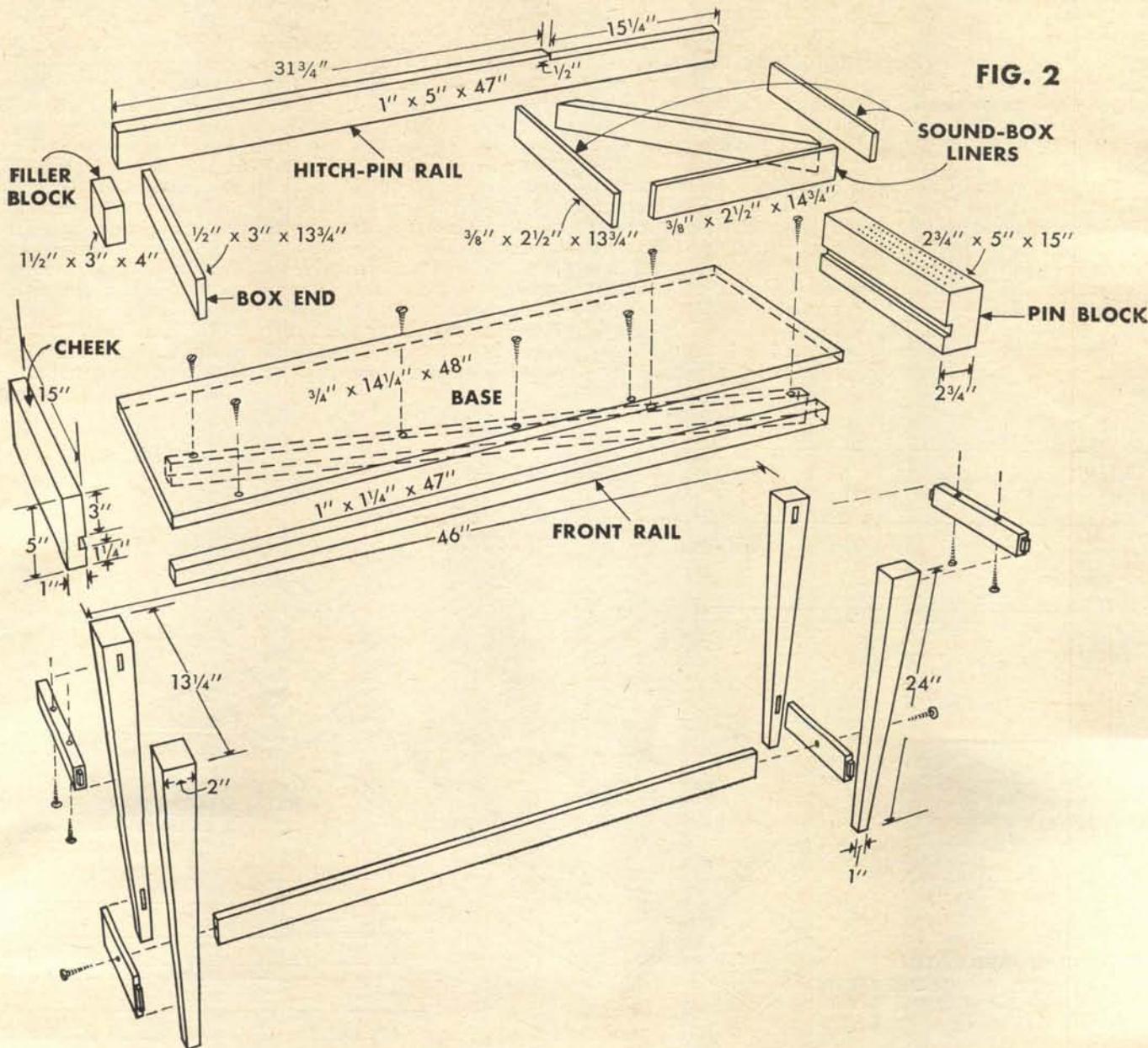
1. Basic inner frame has base of $\frac{3}{4}$ -in. fir plywood, other parts are cut from maple. Leg assembly is walnut solid stock.

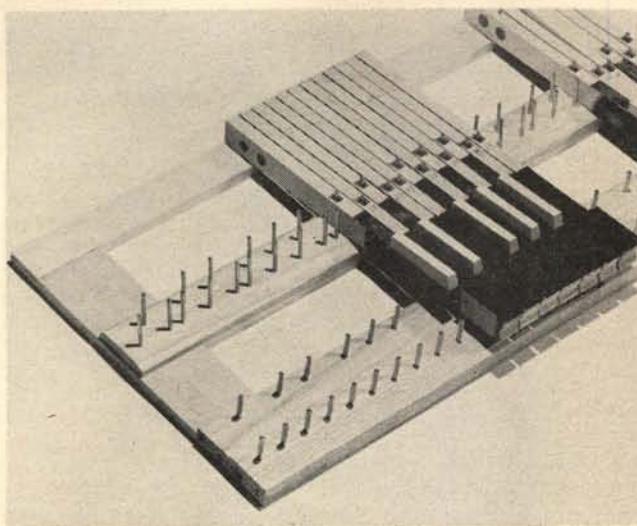
the clavichord has never gotten completely out of favor, as a piano cannot equal the musical quality of the smaller instrument. The clavichord is excellent for students who want a practice instrument light enough to move about, and which is small enough to fit in a small corner. Apartment dwellers find the small size handy, and the styling will fit with modern or period furnishings. Best of all, the clavichord can be played without disturbing the neighbors. Musically, the instrument has a range of slightly over four octaves, extending from two full octaves below middle C, to over two octaves above it. It has fifty-four strings that stretch from the hitch-pin rail on the back, across fifty-four keys, over a bridge and to individual tuning pins on the right in the pin block, as in the lead photo and Figs. 5, 6, 7 and 8. On each key is located a small, upright blade called a "tangent" that strikes the string above when the key is depressed. The tangent causes the string to vibrate, which excites the soundboard to produce the musical sound.

The clavichord consists of an inner frame made of maple and plywood, Figs. 1 and 2, which is covered by a walnut case. The inner frame supports the key-

board and soundboard, and is rigid enough to resist the pull of the fifty-four strings that each add about 10 lbs. of tension.

Start construction by building the inner frame, Figs. 1 and 2. The plywood base is fitted in dadoes cut $\frac{1}{2}$ in. deep in the cheek, the hitch-pin rail and the pin block. Before installing the pin block, lay out the pattern for the holes, as indicated in Fig. 8. At each location drill a $\frac{1}{16}$ -in. hole to a depth of $1\frac{1}{4}$ in. Screws to hold the plywood to the various pieces are set in drilled and countersunk holes. Along with glue, use two screws each in the cheek and pin block, and four through the hitch-pin rail. On the plywood base are glued the filler block, the box end and the box liners. Two of the liners are maple, but the one against the pin block can be plywood. The diagonal brace in the sound box is cut from $1 \times 2\frac{1}{4}$ -in. maple, and made to fit tightly between the liners as in Fig. 1. Use glue and screws driven up through the base to hold it. The front rail is attached to the underside of the front edge with glue and screws, then a diagonal brace cut from a length of 2×4 -in. maple is fitted from the right front corner to the left rear on the under-





3. Keyboard fits on frame consisting of three strips held by crosspieces. Note location of guide and pivot pins for keys.

side of the base. It starts just inside the front rail and pin block and runs to just inside the cheek at the rear of the base. Fasten it with glue and screws driven down through the base. Note that all stock measurements are net: The 2 x 4 diagonal, for example, is a full 2 in. x 4 in.

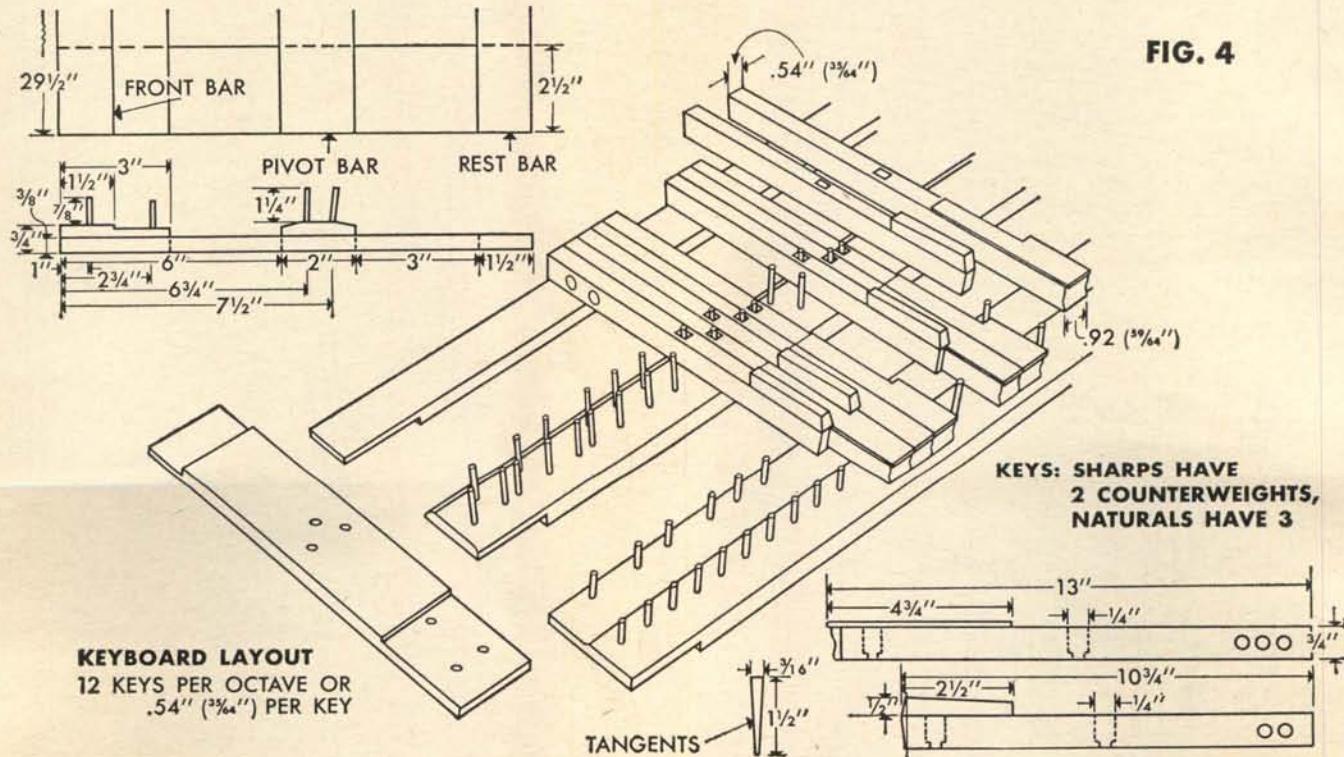
The leg assembly, Fig. 2, consists of four legs 2 in. square at the top, tapering to 1 in. at the bottom. Four short stretchers join the pairs of legs, a longer stretcher joins the two pairs. Use mortise-and-tenon or dowel joints between the members. Attach the leg assembly with glue and screws driven up through counterbored holes in the upper stretchers.

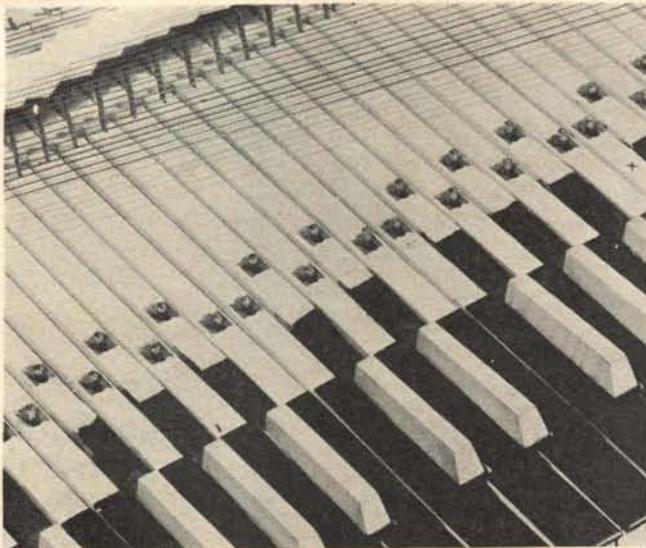
Strength as well as a finished appearance is added to the instrument by the case fitted around the inner frame. The case is cut from 1/2-in. walnut-faced ply-

wood, the front, back and side panels (6 1/2 in. high) mitered at the corners and glued to the inner frame. A section is cut out of the front panel, then refitted with hinges to cover the keyboard when the instrument is closed, lead photo and Fig. 6. A lid, or top, not shown in Fig. 2, but illustrated in the lead photo, is cut from 1/2-in. walnut plywood. It has a 1/2-in. overhang at the front and both sides, but is flush at the back of the instrument where it is fastened with three brass butt hinges. A brass folding bracket is located at the righthand end of the lid to hold it so it leans back slightly when open. The angle helps hold sheet music on a rack made from a strip of walnut measuring 1/2 x 1 1/2 x 16 in. A groove is cut in the upper edge to hold the music. Locate the rack at a height convenient for the person who will play the instrument. Do not attach the lid now.

Mark the locations of the pins in the hitch-pin rail and cheek, Fig. 7, and drive in the pins. (Hitch pins can be purchased or made from 6d finishing nails with the heads cut off.) Slant the pins away from the soundboard end of the clavichord to prevent the strings from slipping off under tension. The pins should project about 1/4 in. Tuning pins, (zither pins), now are turned into place in the pin block, using a tuning wrench. Allow the pins to project 1/4 in. Both zither pins and the wrench should be available from music stores, as they are used on zithers and autoharps.

The name board, Fig. 7, is cut from 1/2-in. walnut plywood 1 1/4 in. wide and 30 1/2 in. long. It is not installed until after the keyboard and its assembly are installed, as well as all strings and tangents. It is fitted in a notch cut in the box end at the left end and on the sound-box liner at the right end. It is a force-fit in the notch, and is held by two short dowels on the liner. It is made to be removed easily to gain access to the keyboard assembly. A lid now is cut from 1/2-in. walnut plywood to cover the "tool box" formed between the box end, the filler, the cheek and the front panel, as in the lead photo. Note that its inside edge is flush with the box end, the back end is just clear of the most forward hitch pin. All exposed plywood edges now are veneered with tape, and molding

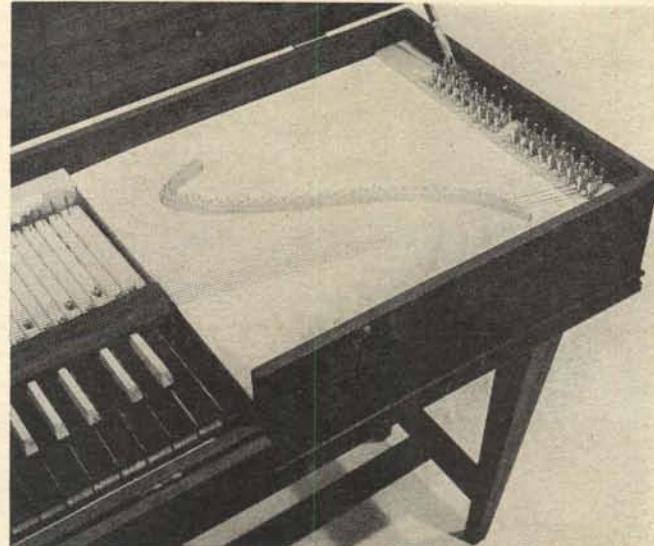




5. Tangents are fitted on each key, located so they press against the strings when key is depressed, to produce music.

can be added to the lower edge of the clavichord case—as on the original, if desired. Case, lid and leg assembly, as well as the name board are now finished to suit. A hand-rubbed oil finish was used on the original to more closely duplicate the finish used on antique instruments.

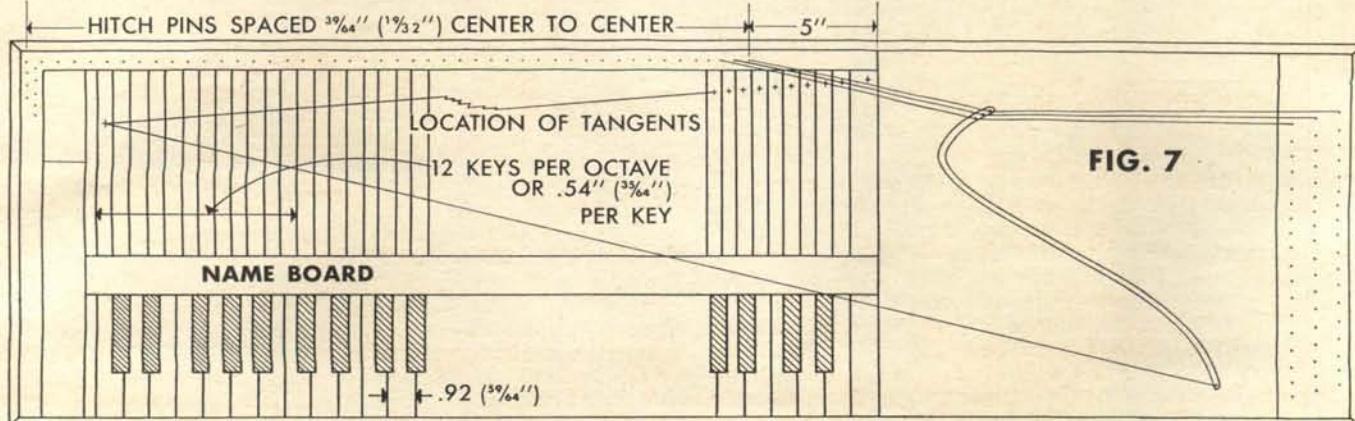
The keyboard, Figs. 3, 4, 5 and 7, is next. The keyboard frame is first, Figs. 3 and 4, and consists of three strips joined at the ends by crosspieces with half-lap joints. The strip nearest the player is the front bar, and it is notched to limit the dip of the keys when they are depressed. The pivot bar is at the center, the keys pivoting on it and resting on the rest bar at the back when they are not depressed. The frame assembly is clamped and glued, but not nailed or held with screws. Next, a piece of clear, straight-grained white pine, measuring $12\frac{3}{4} \times 29\frac{1}{2}$ in., (12 $\frac{3}{4}$ in. with the grain), is positioned on the key frame and held with clamps. Holes are drilled through the pine into the key frame for the pivot pins and guide pins, Fig. 4. Note that the pivot pins for the sharps are farther back than for the naturals, and that the guide-pin holes for the naturals are much nearer the front than the holes for the sharps. A clearance hole for the pins is drilled first, then is counterbored $\frac{1}{4}$ in. about three-fourths through each key. This permits an easy pivoting action by each key. After drilling all the holes, the pine plank is removed and the pins are driven into the frame. The pins can be $\frac{1}{8}$ -in. wire, or finishing nails with the heads cut off. At this time the plank is band-sawed into individual keys. (We



6. Strings bear against bridge pins, pull down on bridge strongly as they slant down toward tuning pins at right.

show one shape of key, you may wish to copy those on a piano or organ you have seen.) Number the keys, beginning at the lefthand end. The raised portions of the sharps now are cut and cemented to the keys. The naturals are covered with ebony veneer—or black plastic laminate, and the sharps are covered with boxwood veneer or white laminate. Counterweights are installed in the keys. Either pour melted lead into $\frac{1}{4}$ -in. holes in the keys, or fit in lead slugs precast for that purpose. (The slugs and other components can be purchased. Sources are listed at the end of this article.) The rest bar is covered with a strip of $\frac{1}{8}$ -in. felt to silence key rattle. Felt washers $\frac{3}{32}$ in. thick are fitted on the pivot pins and guide pins for the same purpose. If the keys are not all at the same level, shim them with paper washers until all are on the same plane. The tangents, Fig. 4, are cut from brass or tempered-aluminum sheet about .051 in. thick.

The soundboard is cut from $\frac{1}{8}$ -in. spruce, Fig. 8. Note the grain direction. The bridge is cut from $\frac{1}{2}$ -in. maple to the shape shown. Be precise when enlarging the pattern from the squared drawing, as the shape of the bridge largely determines the tone of the instrument. Position the bridge and lightly trace its outline on the soundboard. Mark the centerline of the bridge on the board, then drill holes in the soundboard for screws to hold the bridge. About six screws should be used. Around each hole fit a washer of maple or plywood as reinforcement, gluing it to the underside of the soundboard. Attach the bridge



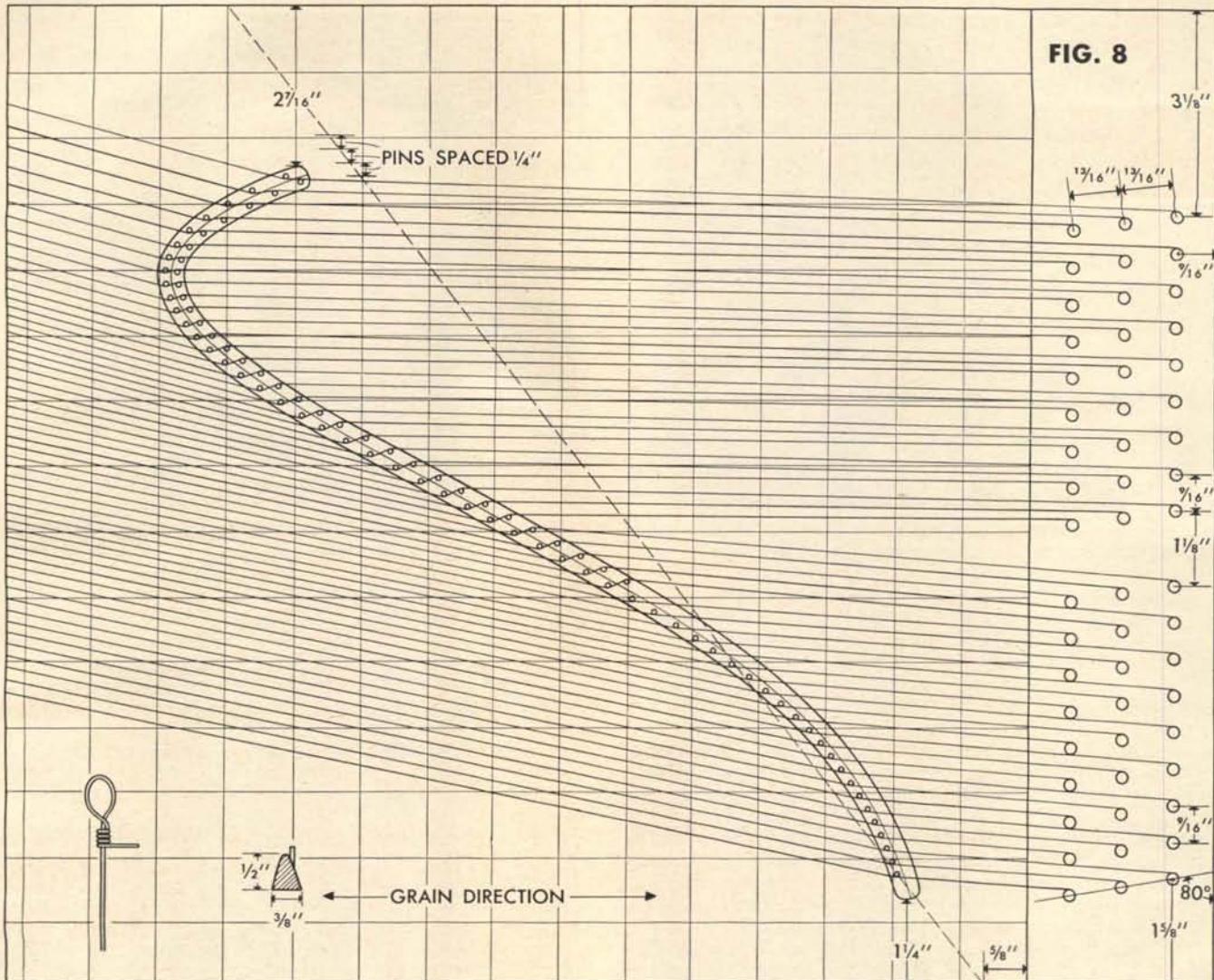


FIG. 8

FIG. 9



with glue and screws and mark the location where each string crosses it, Fig. 8. Drill holes slightly undersize to receive the bridge pins, that can be brass wire, escutcheon pins with the heads removed or regular pins available for the purpose. It is advisable to add a second bridge pin for each string above middle C, Figs. 6 and 8, to help reduce side load on the bridge and to prevent string vibration between the bridge and tuning pins. The clavichord now is ready for stringing. Note that the strings vary in diameter, as follows:

Key No.	Note	Wire Size, Inches
1- 6	C-F	.026 brass
7-10	F#-A	.024 brass
11-14	A#-C#	.022 brass
15-17	D-E	.020 brass
18-21	F-G#	.016 brass
22-34	A-A	.014 steel
35-54	A#-C	.010 steel

Each string is attached to a hitch pin with a loop, Fig. 8, about 1 in. of the end of the wire being twisted about itself, leaving a $\frac{1}{4}$ -in. tag bent at right angles. Each string then is stretched across the bridge and the bridge pins, then to its tuning pin on the pin block. Cut off the wire, allowing about 4 in. extra. The excess length is wrapped around the pin. The first turn of wire should be near the bottom of the pin, to assure that the wire slopes upward to the bridge, thus holding the bridge down firmly. Do not tighten completely any string until all are in place. After the stringing

is complete, the instrument will have to be tuned several times before the strings will stay in pitch. This is due to the natural stretch, or "creep", of the wire.

Put the keyboard in place. The location at which each string crosses the centerline of its particular key should be marked with a dot. Remove the keyboard and make a second dot $\frac{1}{4}$ in. behind the first, (toward the back of the instrument), to mark the actual location of the tangents. The tangents now are driven into the wood about $\frac{1}{2}$ in.; there must be $\frac{1}{8}$ in. between the top of the tangent and its string. Smooth and polish the top edges of each tangent, then replace the keyboard. The tangents will not be directly below their respective strings. It will be necessary to gently press and position the top of each tangent until, as the key is depressed, it strikes and holds the string.

At this point, remove the lid of the tool box and

cut the notch for the name board. Locate the name board so it is above the plane of the keys and slightly in back of the sharp keys. It must be located so the keys do not click against it when they are depressed. Use a saw to mark the notch for the name board, then carefully chisel it to size. Be gentle in this operation, or you may loosen some of the strings. At the opposite end of the board, drill two holes for two short dowels that are fitted in the end of the board to hold it in place, yet make it readily removable.

Tuning the instrument is exacting, but not difficult. It can be brought up to rough pitch by using a piano or other instrument of known pitch, for comparison. Also, pitch pipes can be used to tune a complete octave. Then the instrument is tuned down the scale, and finally up the scale, by octaves.

Greater tuning refinement can be attained by tuning to intervals. These intervals, (fifths), are shown in Fig. 9, along with their "proofs." In this procedure it is important that the original A be accurately tuned to 440 cps, (cycles per second), with a tuning fork, as it serves as a reference by which succeeding notes are tuned. The effective tuning process depends on your ability to hear "beats," and to gently but firmly, turn the tuning pin to bring a note to desired pitch. When an interval is in tune, there are no beats. As the interval goes out of tune, the beat frequency gradually increases. The subject of tuning should be studied more completely, using reference books on piano tuning, which are available at music stores and libraries.

As a key on the clavichord is depressed, the tangent of that key should lift about $\frac{3}{8}$ to $\frac{1}{2}$ in., stretching its respective string. There should be sufficient stretch so that the note played will gradually go sharp as the key is depressed. When the keyboard and tangents

have been properly located, remove a key at each end of the keyboard to permit drilling clearance holes for screws. Use glue and screws to attach the keyboard permanently. It is also important to insert damper felt between the strings, Fig. 5. The felt should be from 1 to 2 in. wide and is pushed down between the strings, between the tangent and the hitch pin of each string. The felt prevents string vibration between the tangent and hitch pin, and stops all vibration of a string when it is released by a tangent.

The correct touch for playing a clavichord is much lighter than for a piano. A well-built, properly adjusted and tuned clavichord should require very little attention, will provide music no other instrument can produce and will be a treasured heirloom for the generations to come.

All wood necessary for the clavichord can be purchased from several of our advertisers who sell wood and supplies to home craftsmen. Other parts that are difficult to obtain are available from Paul Brandt, 9319 Cherokee Rd., Richmond, Va., as listed below: Keyboard, without key coverings, counterweights or felts, \$46.00

Key-Bed Kit, all felt washers and rest-bar strip, \$2.80
Counterweights, $\frac{1}{16}$ -in. key leads, set, \$4.00

Set of Guide and Pivot Pins—not needed with above keyboard, \$2.00

Set of Strings, \$4.80

Tuning Pins, complete set, \$5.40

Hitch Pins, complete set, .35

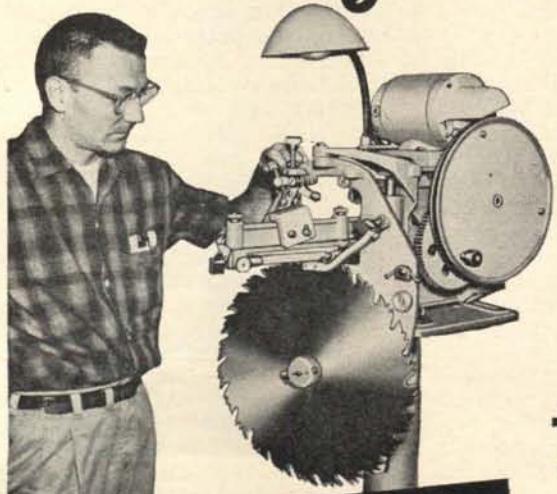
Bridge Pins, complete set, .70

Tuning Wrench, \$2.00

Tuning Fork, (A—440 cps), \$5.50

Complete kits, not parts for clavichords also are available from Zuckermann Harpsichords, 115 Christopher St., New York, N. Y. 10014. △ △

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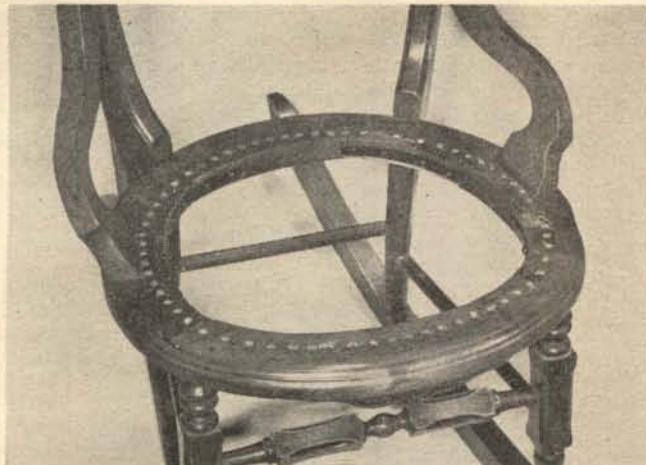
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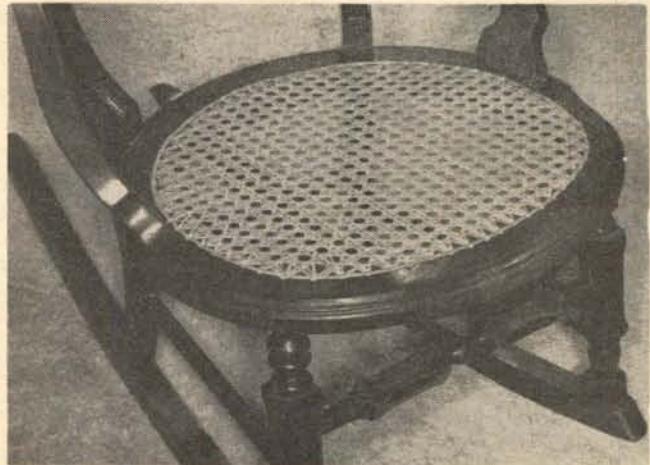
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1. Before recaning this antique rocker, the seat frame was repaired, all loose joints reglued and wood was refinished.



2. Completed caning of seat. Note straight rows of hexagon-shape holes and binder that conceals holes.

Hand-Woven Cane Seats

ENNO R. HAAN

FIG. 3

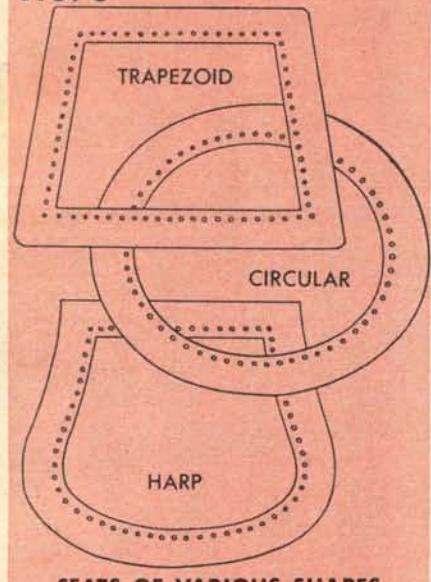
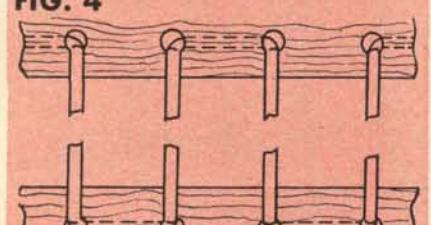


FIG. 4



STEP 1, STRANDS FROM FRONT TO BACK RAILS
NOTE CROSSOVERS UNDER FRAME

FIG. 5



TWO METHODS OF TYING ENDS OF STRANDS UNDER SEAT FRAME

When you restore a fine old chair and find rows of small holes along the inner edges of the seat frame as in Fig. 1, you will have the occasion to weave a cane seat. Although laborious, it is not difficult. Fig. 2 shows a novice's first caning job.

Cane, available from several of our mail-order advertisers (cane for the project shown came from Newell Workshop), comes in several widths. Size to use is influenced by hole size and spacing. Perhaps you can find a bit of old cane in one of the holes. Also, get some "binder" cane which serves as a border and conceals the holes. You will need a small awl with a $\frac{1}{8}$ -in. shank, and four to six tapered pegs about 2 in. long— $\frac{1}{4}$ -in. dowels pointed in a pencil sharpener. A small side-cutting pliers will help.

Soak the cane in water overnight so it becomes pliable and you can handle it with less risk of kinking and breaking the fibers. The strands come in 10 to 15-ft. lengths. After soaking they are easier to separate and you can wind them into separate little coils for convenience. Keep the cane moist when using it. If the chair is to be repaired and refinished, this should be done before it is caned.

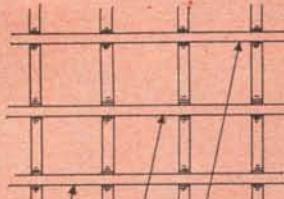
Although it is easiest to weave a seat that is perfectly square, most seats have shapes as shown in Fig. 3. The following procedure applies to any shape. When starting, the basic idea is to get the front-to-back strands parallel to the centerline of the seat, and the side-to-side strands at right angles to these.

In examining the cane you will notice that one side is smooth, shiny and slightly rounded. This is the finish side which faces up on the seat. To avoid getting the cane twisted with the wrong side

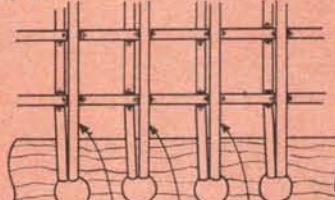
up, pinch it lightly between your thumb and index finger at the starting point where it emerges from a hole. Then, with the other hand, pull the cane between the thumb and finger as far as the distance to the next hole, and hold it so while pulling the strand through the hole. This automatically untwists the cane and helps keep the finish side up. Full-length strands can be handled with ease during the first three steps, but for subsequent weaving steps it will be more convenient for the beginner to use strands about 5 ft. long.

Step 1: See Fig. 4. Start at either front or back rail near the center. Push the ends of a strand up from the underside through two adjacent holes so the extending lengths are equal. Press a peg into one hole to hold the cane firmly. Slip each extending end down through the corresponding two holes in the opposite rail, pull taut but do not stretch tightly, then press a peg into each hole. Check to see if the finish side of the cane is up. Next, push the strands up through adjacent holes in the same rail and go across to corresponding holes in the opposite rail. Transfer the holding pegs to these holes to keep the laced cane taut. Continue in this manner until you come to the end of the strand. This you tie underneath the seat to cane already laced, using either of the two knots shown in Fig. 5. For tying, the strands should project no less than 2 in. After tying, the excess is snipped off. It is important that the cane be moist while tying. Do not pull up too tightly or you may break the strand already laced. Also, avoid twisting the cane when tying.

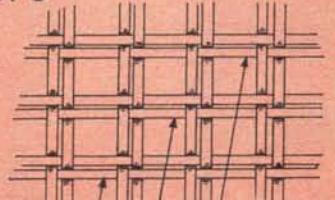
To continue, tie the end of a new strand where the previous one

FIG. 6

STEP 2, STRANDS GO FROM SIDE TO SIDE AT RIGHT ANGLES TO STRANDS OF STEP 1

FIG. 7

STEP 3, STRANDS GO FROM FRONT TO BACK, NEXT TO THOSE OF STEP 1 AND OVER STRANDS OF STEP 2

FIG. 8

STEP 4, SIDE-TO-SIDE STRANDS OVER THOSE OF STEP 3 AND UNDER THOSE OF STEP 1

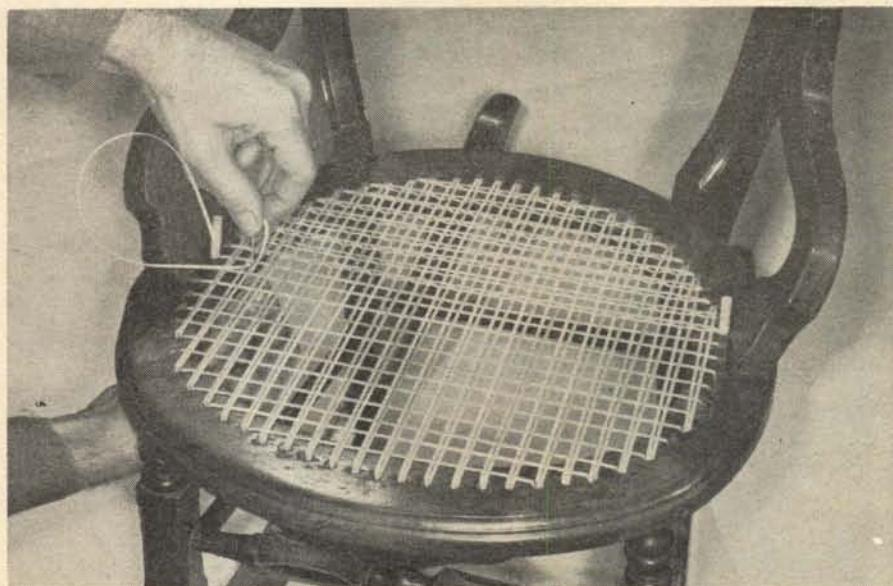
ended. When approaching the side rails in curved or trapezoid-shape seats you will have to skip some holes, usually, to keep the strands parallel and equidistant. Before stopping for any length of time, finish and tie the strand you are working with. Otherwise it will dry out and must be moistened with a wet sponge to restore the pliability.

Step 2: See Fig. 6. Repeat the foregoing procedure from side to side, getting the strands at right angles to those already installed.

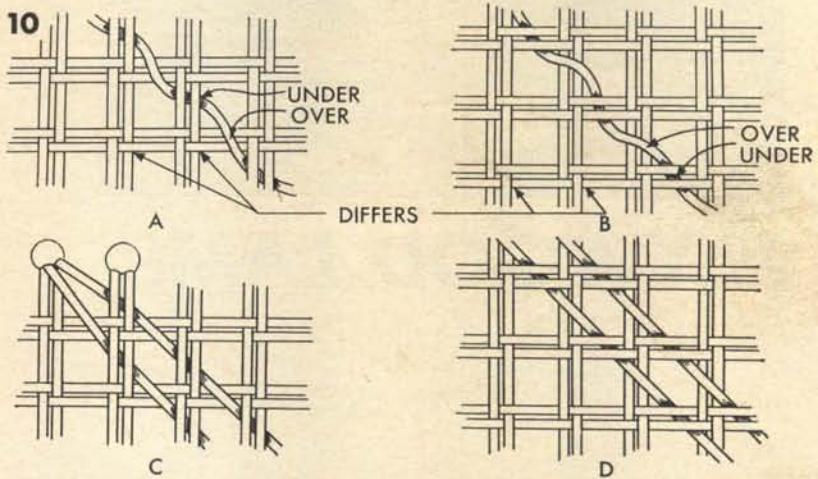
Step 3: See Fig. 7. Repeat Step 1 but start at the opposite rail. As you proceed keep the new strands on the same side of those already installed.

Step 4: See Figs. 8 and 9. Again start near the center of either side rail. You practically repeat Step 2 except that you go over strands of Step 3 and under those of Step 1. When finished with this step you pinch the doubled strands together to form small squares of uniform size in straight rows over the entire field.

Step 5: See Fig. 10. Start the first diagonal, crossing the field near its center. This goes over and under the pairs of strands it crosses. Note the slight difference between the weaving in details A and B as pointed out by arrows. Examine your weaving to see which one of



9. Actual weaving starts with second side-to-side strand that goes over and under the two front-to-back strands. Tapered pegs hold portion already woven.

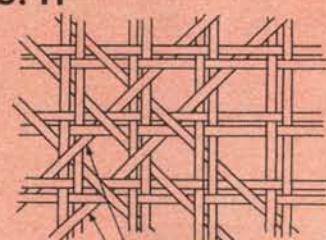
FIG. 10

STEP 5, DIAGONAL STRAND CROSSES PAIRS ALREADY WOVEN

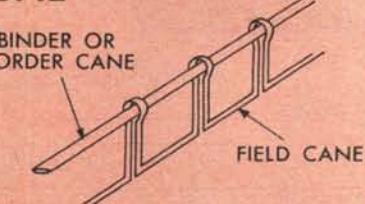
these it resembles and then weave in the diagonal as indicated in each. If not woven correctly, the diagonal will be wavy and cannot be pulled straight as shown in details C and D. Generally, a diagonal returns up through the same hole through which it ended, as shown in detail C, it being tied before returning.

Step 6: See Fig. 11. Install the second diagonal at right angles to the first. This goes under the pairs of strands at points where the first diagonal went over them, and vice versa.

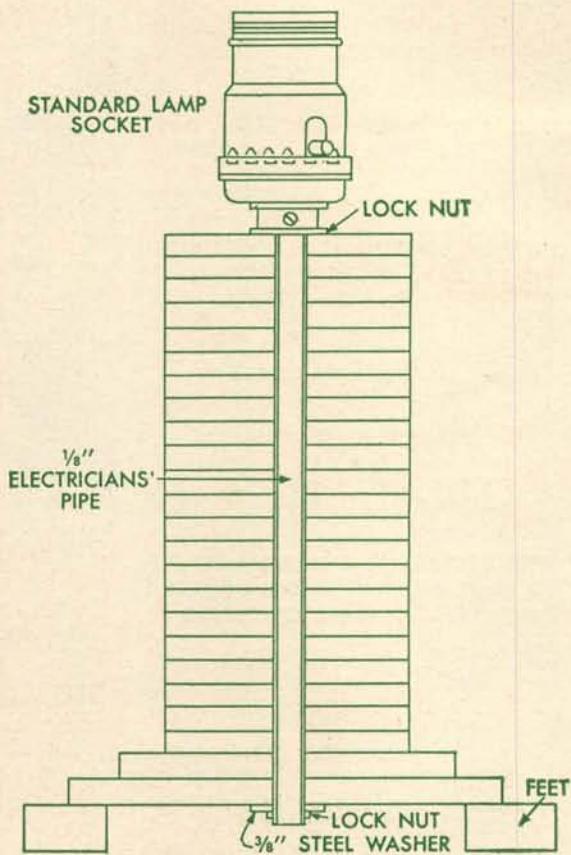
Step 7: See Fig. 12. The binder should be as wide as the hole diameters. If too wide, trim it with a razor blade. Lay the soaked binder finish side up over the holes and lace it in place with a strand of regular field cane. Ends of the binder overlap at two holes of the back rail. The overlapping ends are concealed and held in place by lacing tied underneath. △△

FIG. 11

STEP 6, SECOND DIAGONAL

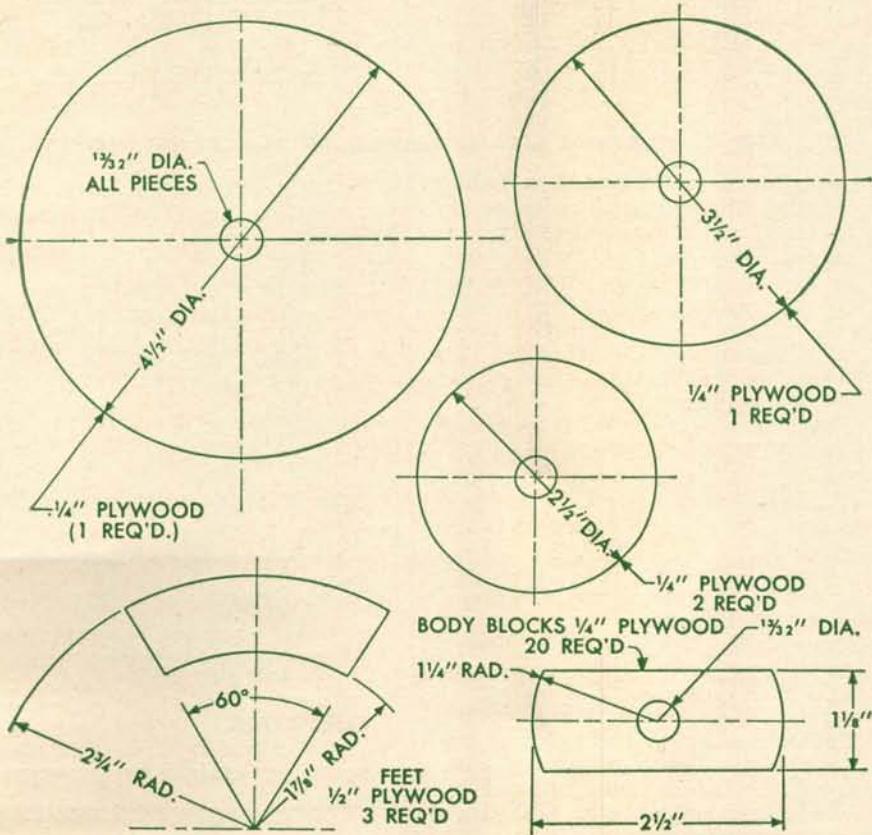
FIG. 12

STEP 7, COVERING HOLES WITH BINDER



PLYWOOD LAMP

C. L. WIDDICOMBE



Almost every home-shop owner finds he is producing a goodly number of plywood scraps that are too small to be used for most projects. This lamp can be made in pairs, and will use up scraps by the dozen.

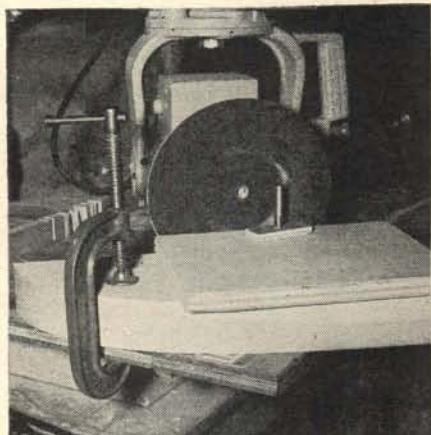
While $\frac{1}{4}$ and $\frac{1}{2}$ -in. stock is shown, there is no reason why other thicknesses of stock cannot be used, and the material may be plywood, solid stock or even particle board. Cut the three disks for the base, then the segments for the feet of each lamp. Simple jigs are shown to permit fast drilling of the various pieces. A simple jig also is shown for sanding each of the various pieces. While these are suggested ideas, many of you craftsmen will devise your own jigs and fixtures.

After stacking the various disks and pieces, measure the height of the stack and cut a piece of $\frac{1}{8}$ -in. electricians' pipe $\frac{1}{2}$ in. longer than the measurement. This allows for a steel washer, two lock washers and the lamp socket. If the pipe is slightly too long after tightening the lock nuts, allow the excess to project at the bottom. Apply glue to each piece as it is stacked on the pipe, then clamp by tightening the lock nuts.

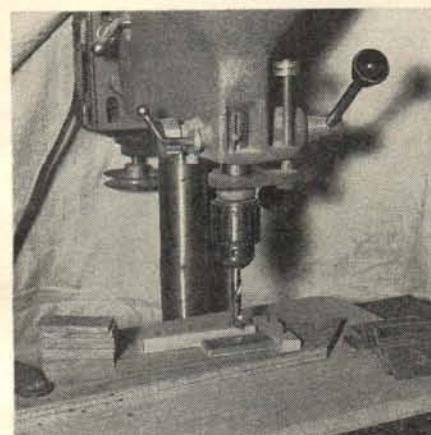
Shades for the lamps can be purchased at most variety, department and ten-cent stores. The lamp column can be painted or finished natural. Several of the lamps were sold at \$5.00 each, which means there is a possible market for them in your neighborhood. △ △



Various disks and pieces are slipped over the pipe, then arranged to provide a "spiral" appearance as indicated.



Another jig can be made to permit quick sanding of the various pieces; it is a pin in board to rotate pieces.



The 20 body blocks and four disks are center-drilled with 13/32-in. bit to accept length of 1/8-in. electricians' pipe.

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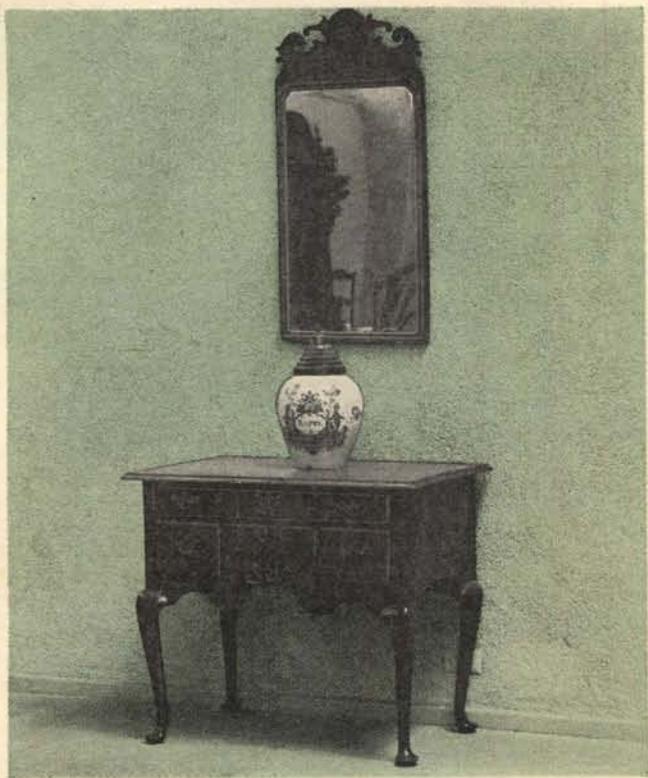
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Lowboy and Mirror

LESTER MARGON

Through the courtesy of the Curator of Furniture and Decoration at the Los Angeles County Museum of Art in Exposition Park, we present in this issue a delightful pair of items that would go beautifully in any entrance hall or foyer. The Lowboy is from New England, probably Connecticut, circa 1730 to 1750, and is a purchase of the Museum Associates from the Balch Fund. The Looking Glass is American, attributed to John Elliott who was known as the Quaker looking-glass maker, working from 1754 in Philadelphia. It is a Museum Purchase for the Denis Bequest.

The lowboy is definitely Queen Anne in inspiration, and while the cabriole leg is a simplification of forms used at that time on objects coming from the Orient, it is extremely interesting to note that an animal cabriole leg was evident on an Egyptian chair from Thebes, and may be seen in the Louvre in Paris. The definition of a cabriole leg in a woodworking textbook states that it is a leg shaped in an elongated S-curve, bulging at the knee and terminating in a foot at the base. Actually there are no rules about designing a cabriole leg except that it should be cut from a square block of wood with some extensions at the top as may be required.

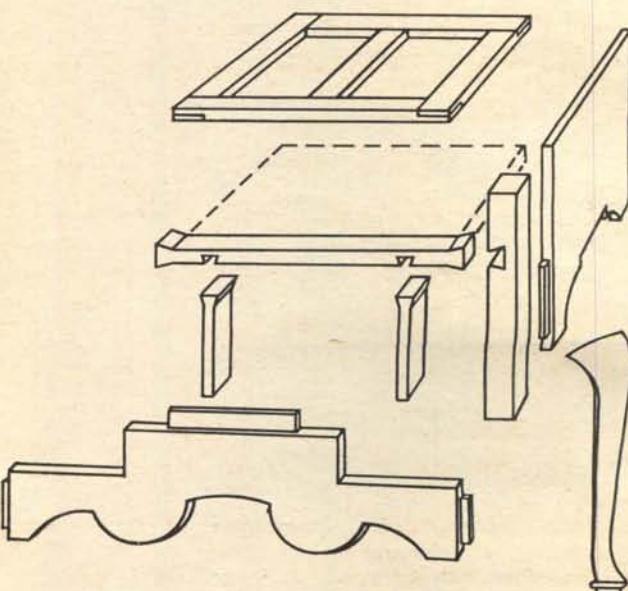
If you are a skilled craftsman, the four legs and the corner posts can be made as units. Otherwise, shape the legs and the posts separately, notch the insides of the legs as indicated and fasten posts and legs with glue and wood screws driven from inside the posts. As indicated in the "pull-apart" drawing, the side

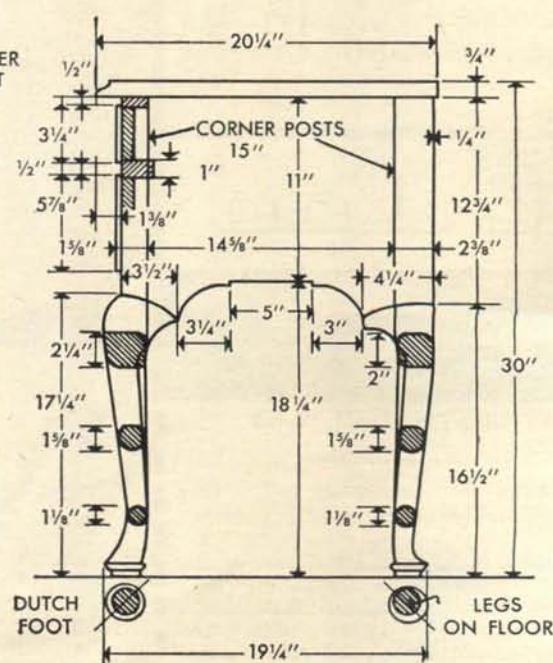
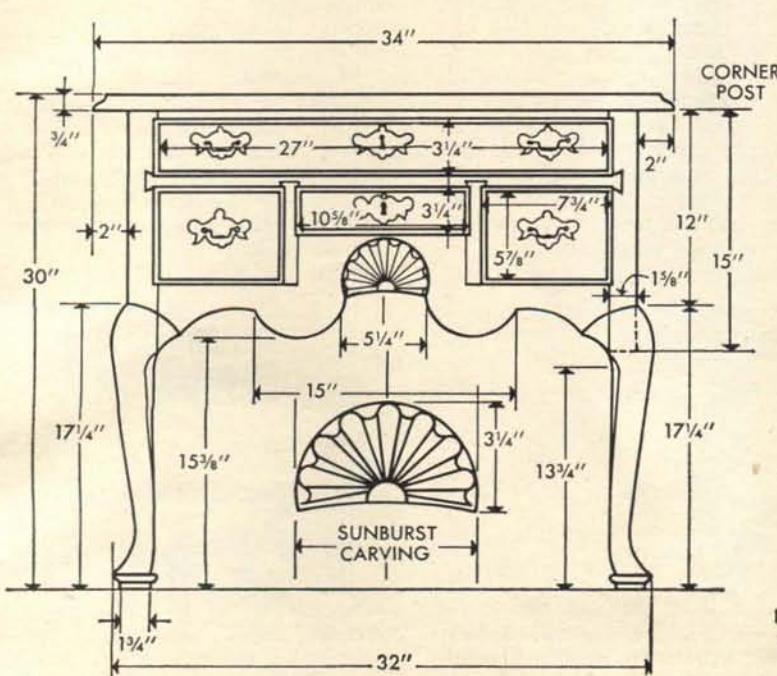
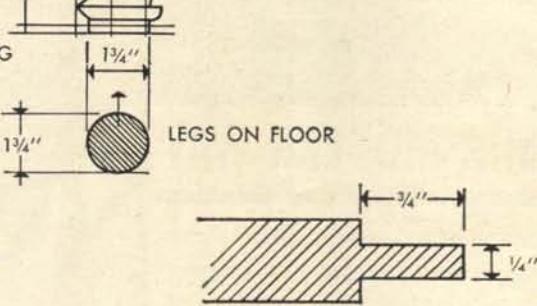
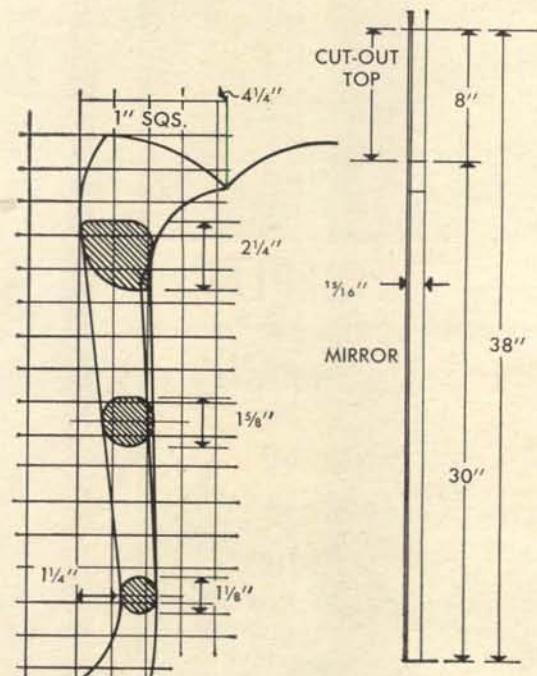
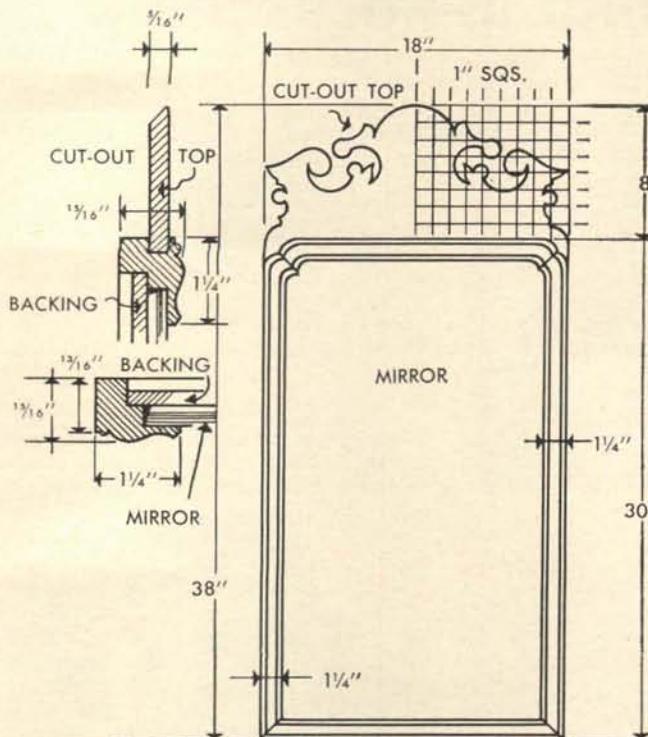
panels of the lowboy are single pieces, on which tenons are cut to fit in mortises in the corner posts. Cherry-faced plywood can be used here. While most Queen Anne furniture was made of walnut, the builder of the lowboy used cherry, it being a locally-available lumber. The lower front panel of the lowboy also is cut from cherry plywood. The two short dovetail strips and the horizontal member should be cut from solid stock. Keep in mind that the drawer fronts project $\frac{1}{4}$ in. all around, which makes these strips seem narrower than they actually are. If you have no router or shaper, the dovetail notches can be cut with a table or radial-arm saw as indicated in the small sketch. It will be necessary to use a wood chisel to smooth up the bottoms of the grooves. There are two frames in the unit, such as shown in the pull-apart drawing. One fits behind the lower horizontal strip, the other at the upper part of the unit just under the top. The upper frame is covered in front by a $\frac{3}{4}$ -in. strip that extends from corner post to corner post.

The drawers are standard construction with a $\frac{1}{4}$ -in. overlap as previously stated. The overlapping portions of the drawer fronts also are $\frac{1}{4}$ in. thick. Because of the bevel on the fronts, they should be cut from solid stock, rather than plywood. Antique brass hardware, similar to the type shown, should be used for greater authenticity. Several WORKBENCH advertisers who sell to home craftsmen stock such hardware.

The top for the lowboy also should be made up from solid stock, as the shaped edge would show the edge grain of plywood. If you wanted to settle for a square edge, plywood could be used and covered with veneer tape. Several pieces of cherry would have to be edge-glued to make a top of the size required. If you are a woodcarver the sunburst on the front of the item would be a definite challenge; if you are like most woodworkers, you will settle for a ready-made carving of similar style and size that can be purchased.

The mirror has a mahogany frame, shaped as an ogee molding, with "broken" corners at the top. The upper panel is a scroll-sawed design of simple but graceful curves. Be accurate with the corner miters and finish with careful sanding so the end result is a glass-smooth surface. After the finish has been applied to both the lowboy and the mirror, you can give the appearance of the patina of age by going over all surfaces with fine steel wool. An application of paste wax will protect the finish. △ △







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When you have a full-time job, and a family to consider, going to school to learn a professional skill is extremely difficult. There just is not that much time in a day. You will, however, have some hours during a week, and on weekends, that could be used for studying. Home-study courses are the ideal solution for such a problem; you use those infrequent spare hours for studying, and you choose your own pace in completing the course. Also, while

it might take years of apprenticeship to learn some skills, modern teaching techniques make it possible to master a skill in just a matter of months.

Upholstery and furniture repair are two of the skills that can be learned through a home-study course. While taking the course you can beautify the furniture in your own home with what you are learning, and when you finish the course you can get a job in the field of



Upholsterers' tools are provided with the course, as well as explicit instructions in their uses when doing a job.



Upholstery never becomes boring, as each new job presents a new problem; you create a new thing of beauty.

upholstering, or start a business of your own. Many students take such a course for their own information, then find the hobby becomes a profitable one when jobs for friends and neighbors bring home a profit.

If you do much woodworking in your home workshop you will have very little difficulty in mastering the skills required for furniture repairing and upholstering. Included in the home-study course are kits of material for several projects that help give you practical experience. Home-study courses are not all study; practical projects must be included if a student is to learn the subject completely. The upholstering course begins with the basics of furniture construction, takes you on through the stripping and rewebbing of furniture, and how to pad and recover. Included in the course are instructions on building a boudoir chair, a chaise lounge and an occasional chair. How to use sheet plastic and plastic foams is described.

Making cornices, which can be a very profitable sideline in upholstering, is described in one section of the course, as is the making of slip covers. At the end of the course there is even an extensive section on opening and operating your own business.

Because upholstering and furniture repair does not require a great deal of physical strength, older people, and women, can get into the business. There are many successful husband-and-wife teams in the furniture repair and reupholstering business; the wife doing most of the covering and handling of material, while the husband does the repairing, spring retying, webbing and other jobs.

If you are interested in obtaining information on a home-study course in furniture and upholstering, write to the Modern Upholstery Institute, Fallbrook, California and tell them of this article. △△

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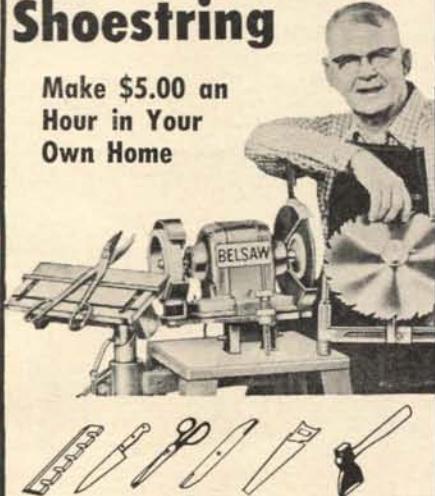
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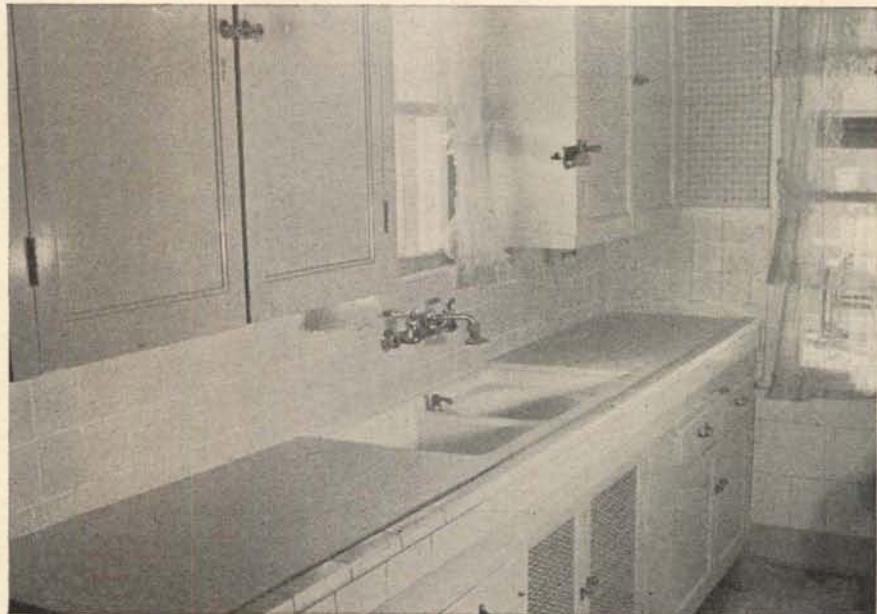
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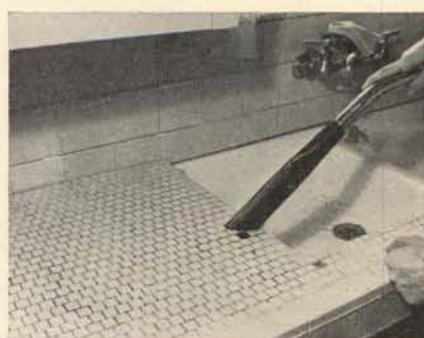
the staining problem. The photos show step-by-step the regrouting of a counter top, using a recently-formulated material that sets quickly—it is a two-part mix—and is extremely stain-resistant. It can be purchased at tile-supply outlets and hardware stores. △△



First step is to clean joints of old grout, using sharp tool such as ice pick. Follow this with thorough wire-brushing.



Next, carefully clean the tiles, making sure all moisture is removed. Lacquer thinner is good; cleans well.



Vacuum cleaner was used to assure complete removal of all loosened grout and other material from the tiles.



Resist-Stain Grout by Houghton Laboratories, Olean, N. Y. comes in kit with clean-up solvent for complete job.



Two parts of epoxy grout are mixed as per directions. Avoid contact with material as some people are allergic.



After mixing, immediately apply grout with spatula. After 15 minutes, remove excess as per instructions, then polish.



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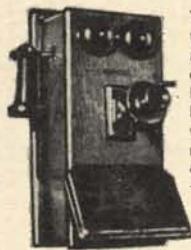
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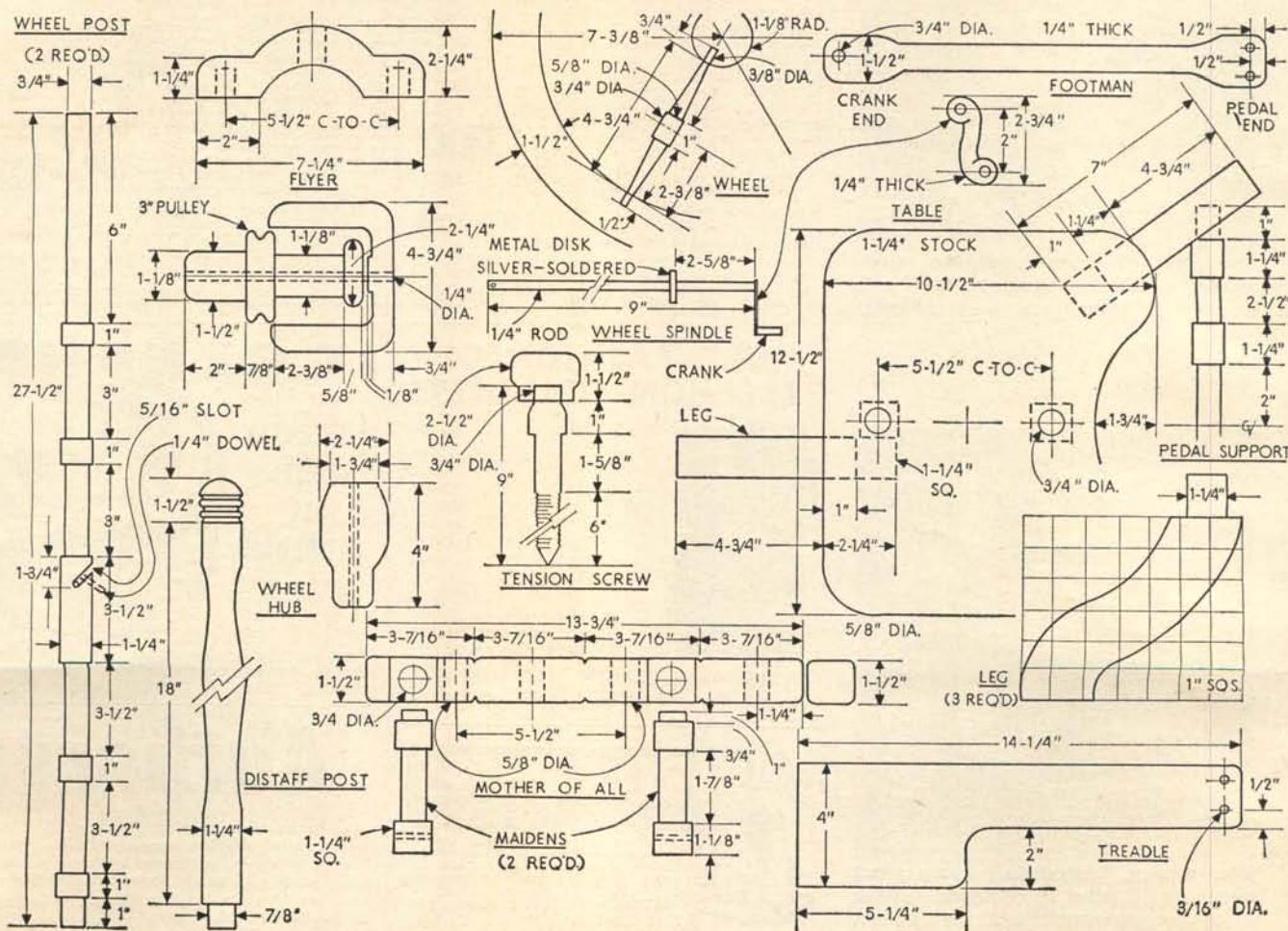
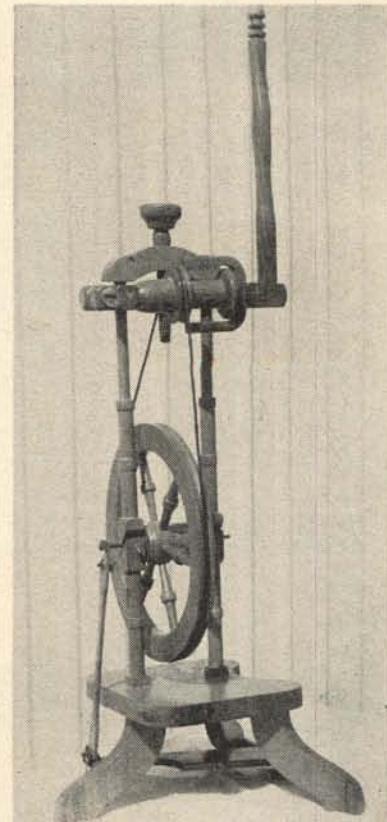
Vertical Spinning Wheel

A. R. KAHN

Quite likely an ancestor of the graceful spinning wheels shown in the January-February and March-April 1963 issues, this vertical model was copied from one on exhibit in the "Arts et Metier Museum" in Paris, France. We have used the same terminology used in the earlier article, despite the vertical construction. The Great Wheel is just 14 $\frac{3}{4}$ in. outside diameter, with a rim of six segments. Holes for spokes in the hub allows some movement to help center the hub. When the wheel is centered, pin the spokes to reinforce the slow-setting glue used. Note that the outer ends of the spokes are centered in the segments. Holes are drilled in the rim for the spokes, rather than having the spokes simply butt against the inside, as on the wheel shown in earlier issues. The wheel rim is pre-assembled, then taken apart and the spokes inserted in the hub. The segments then are fitted onto the spokes, the splines between

segments being inserted at the same time.

Leather thongs are used between the lower end of the footman and the treadle. A hinge is used between the treadle and its support. The latter may require being fitted at an angle so the hinge will permit the treadle full travel to turn the crank. To adjust tension on the driving cord, the Mother-of-all is raised on the two wheel posts by means of the tension screw turning in the arch-shaped screw support fitted on the tops of the wheel posts. Shapes of the turnings can be modified; in any case every spinning wheel should have an individuality. Pins in the flyer are brads driven in, then the heads clipped off. The wheel spindle is fastened to the wheel by driving several brads through the sheet-metal disk on the spindle into the wheel hub. White oak was used on the original reproduction; any quality hardwood can be used. △ △



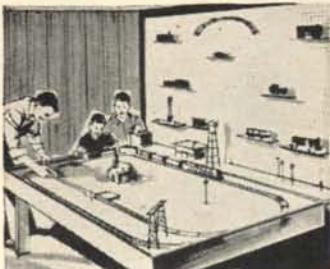
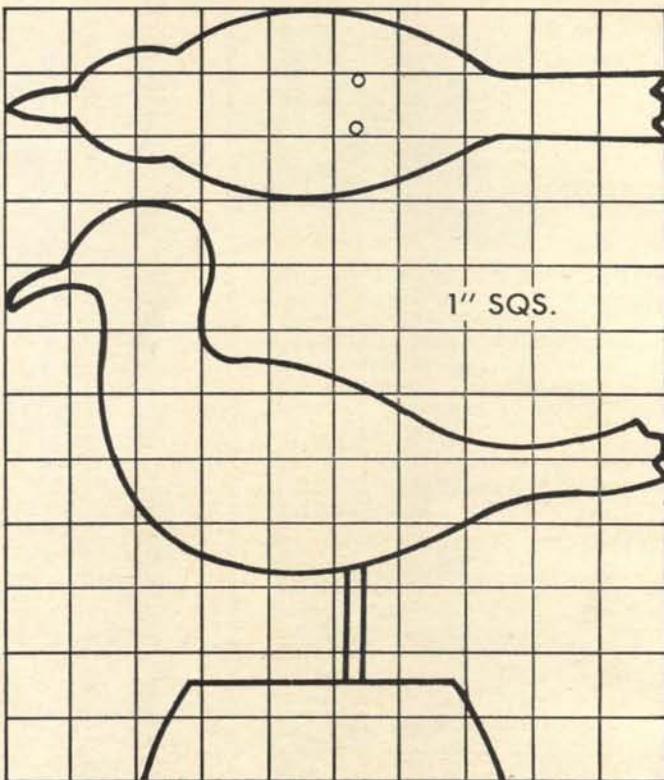
Sea Gull Carving

Leo. E. Sawyer



Simple enough for the beginning wood carver, this sea gull is an attractive project for even an advanced craftsman. Make patterns of the side and top of the bird by enlarging the squared drawing, then mark and cut the side. Temporarily fasten the cut-off pieces with tape or brads, then saw the top view. (The legs are not included in the carving, as they are 3/16-in. dowels.) Carefully carve the rough-sawed shape down to size, then sand all surfaces smooth. Start with 2/0 paper and finish with 4/0. The holes for the legs are spaced about 3/4 in. apart, positioned as indicated in the side view. (The easiest method is to drill the holes before sawing and carving.) Dowels for the legs are 3 in. long; 1/2 in. fits in the bird, 1/2 in. fits in the base. The latter can be a block of the same wood used for the sea gull, or can be a piece of driftwood. The base should measure about 3 x 6 in. and be about 1 in.

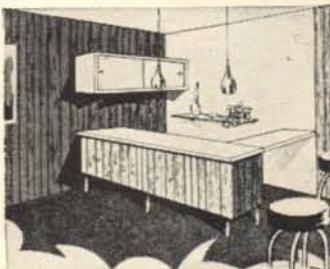
thick. The block of wood required for carving the bird is a 2 x 4 about 9 in. long. If an open-grain wood is used, apply a filler after the sanding. Sand the dried filler, then apply a lacquer. When it is dry, apply a paste wax for a bright finish, use fine steel wool for a dull finish. △ △



41. Model train table



26. Radiator cover and matching bookcase



28. Sip 'n snack center



31. Family leisure center



63. Winter toboggan



45. Sew door

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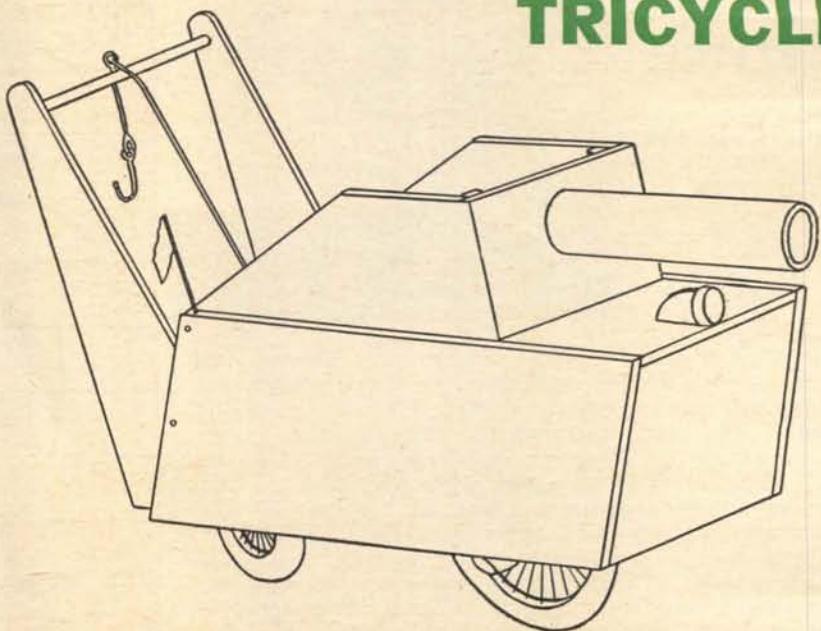


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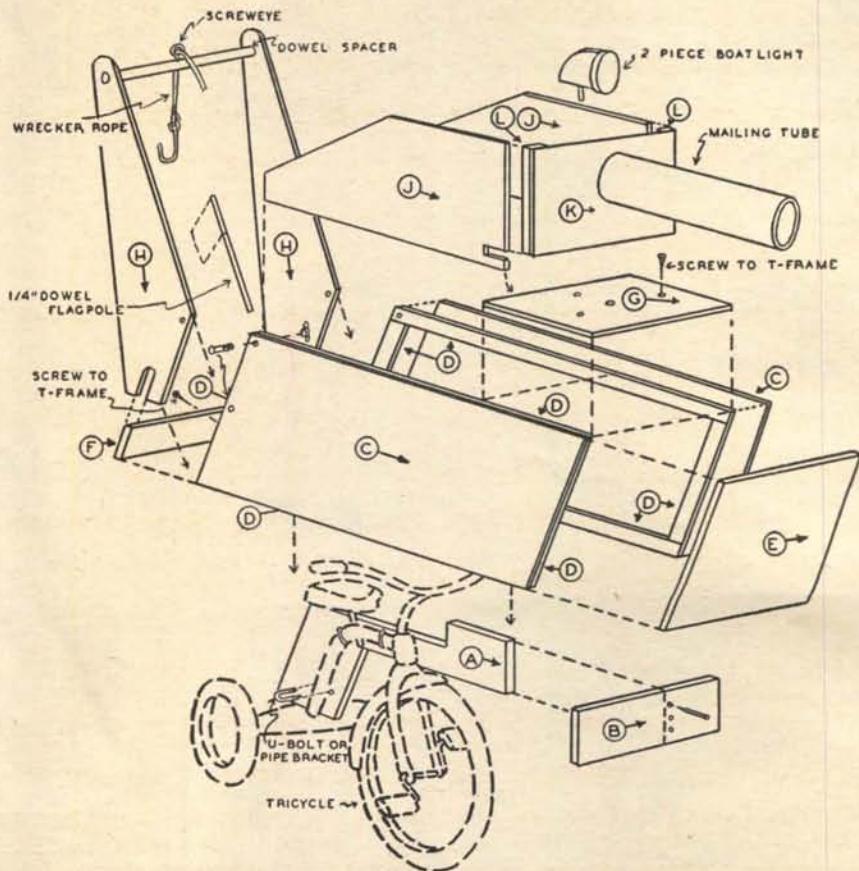
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and B). Note that Part B is offset so its ends are equidistant from the centerline of the tricycle, thus properly positioning the body.

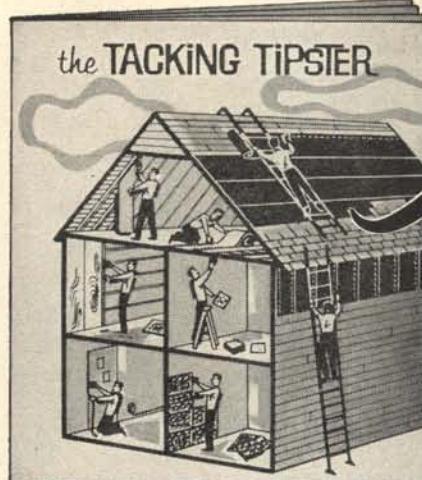
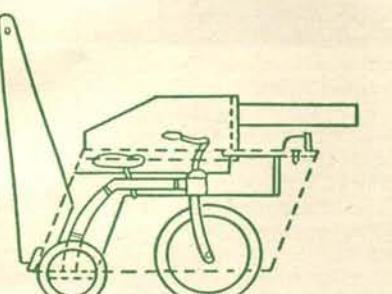
Dimensions are determined by each individual tricycle. Allow at least 2 in. in front and back between the body and the wheels. In determining the width of the body, allow enough room so the handle bars swing easily. The body sides should be at least 5 in. off the ground when positioned.

Start construction by making full-size patterns from corrugated cardboard. This will allow experimenting, and reduce wasting of plywood. Cut out both sides of the body, Part C, as well as Parts J and K, from $\frac{1}{4}$ -in. plywood. All other parts, except A and B, are cut from $\frac{3}{8}$ -in. plywood. Lengths of 1 x 2 are used to frame the Parts C, making them more rigid. Note that the armored "turret" consisting of Parts J and K is designed so notches in J slip onto front deck G, with carriage bolts and wing nuts holding the rear of the turret to the body sides. A length of mailing tube provides a cannon, while a two-piece "light" is used when the tricycle becomes a boat.

The wrecker boom is slotted to fit over cross piece F, and is readily removable also. Carriage bolts and wing nuts hold it to the rear edge of the body panels.

If the tricycle owner is somewhat short, it would be a good idea to make rectangular or circular ports in Parts J and K, to assure visibility. The openings can be left clear, or covered with sheet plastic. Should the driver be taller, a plastic windshield could be made to fit on the upper edges of Parts J and K. With the cannon removed, of course, these members become the sides of the flying bridge of the boat.

Paint all parts in various colors, using an exterior-grade paint, as it is likely the tricycle and accessories will spend a night or two outdoors. △ △



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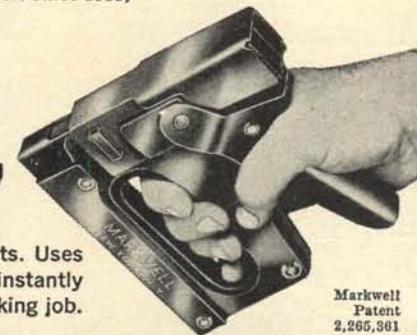
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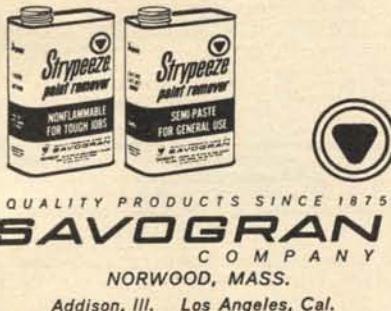


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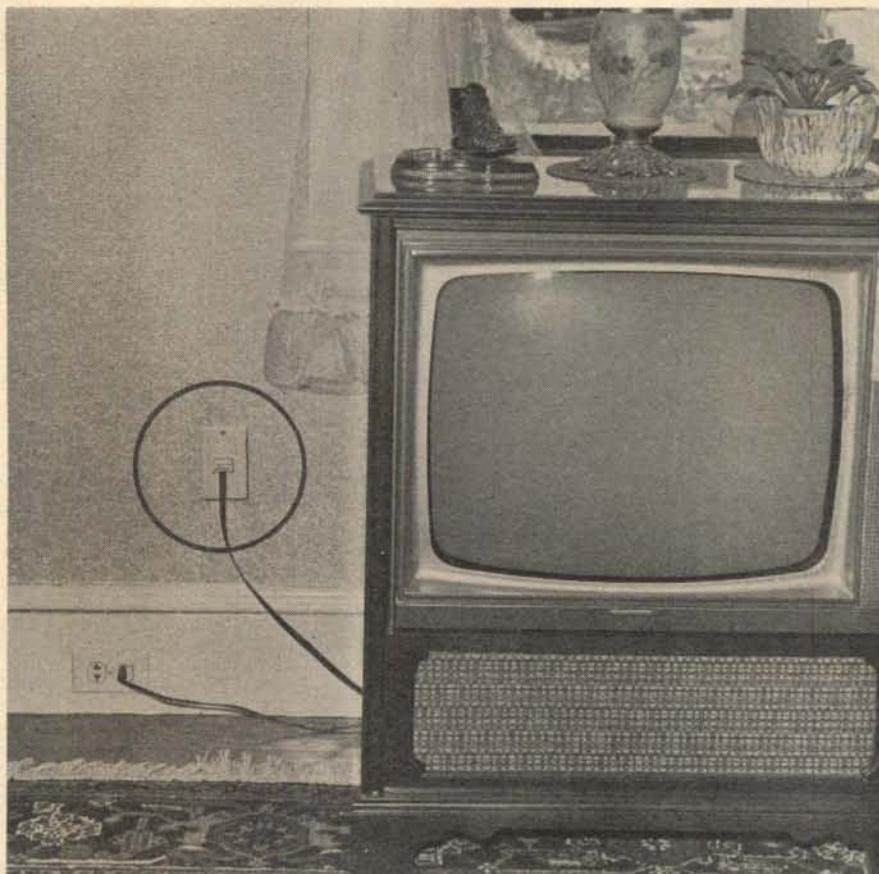
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1. Television set here is moved aside to show new receptacle into which antenna wire is plugged. Receptacle is neat, unobtrusive, even when seen.

TV-Antenna Receptacle

HAROLD P. STRAND

It takes very little time and effort to make your television antenna connection on the wall as neat and unobtrusive as any receptacle used for household current, Fig. 1. An added advantage to such a setup is that when the set is to be moved, the antenna is unplugged as easily as the power cord.

Most antenna lead-ins are first run into the attic, then down through a wall. In the case shown, Fig. 4, the lead was run down an outside wall. A hole is drilled at an angle through the top plates of the wall, Figs. 2 and 4, then a "fish wire" is run down through the hole and inside the wall. An assistant in the room below pulls the fish wire through the opening cut for the receptacle. The size of the opening will be determined by the type of receptacle used; in the case shown the receptacle required an opening

$1\frac{1}{8} \times 3\frac{3}{4}$ in., as per instructions on the box in which the receptacle came. Two sets of clamps are furnished with the receptacle and are clamped at the ends of the opening as per instructions, Fig. 3. With the clamps, there is no need to locate the opening adjacent to a wall stud, as is the case with a power receptacle.

After installing the clamps, the TV twin-lead wire is fastened to the receptacle, Fig. 5. With the particular receptacle shown, there was no need to strip back the insulation on the wire; tightening the clamp on the receptacle causes points to penetrate the insulation and make contact with the wires.

The receptacle now is fastened to the clamps in the wall, Fig. 6, with screws furnished. A receptacle cover is fitted over the receptacle and that part of the installation is



2. TV twin-lead wire is fished down through the wall from the attic. "Fish wire" is used here to guide the TV lead.

complete. Next, a length of TV twin-lead about 3 ft. long is fitted with a plug that matches the receptacle, Fig. 7. It also requires no stripping of insulation, a clamping action in the plug causes contacts to pierce the insulation and press against the wires.

If you have more than one television set in the house, it is possible to use one outside antenna for both sets, if an adapter is used. Install a receptacle for the other set, as described, then run both leads from the receptacles to the adapter in

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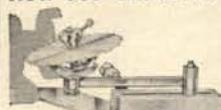
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3. Two clamps are used to hold special receptacle, first are fitted in opening cut in the wall as per instructions.

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HOW TV TWIN-LEAD IS ROUTED IN WALL

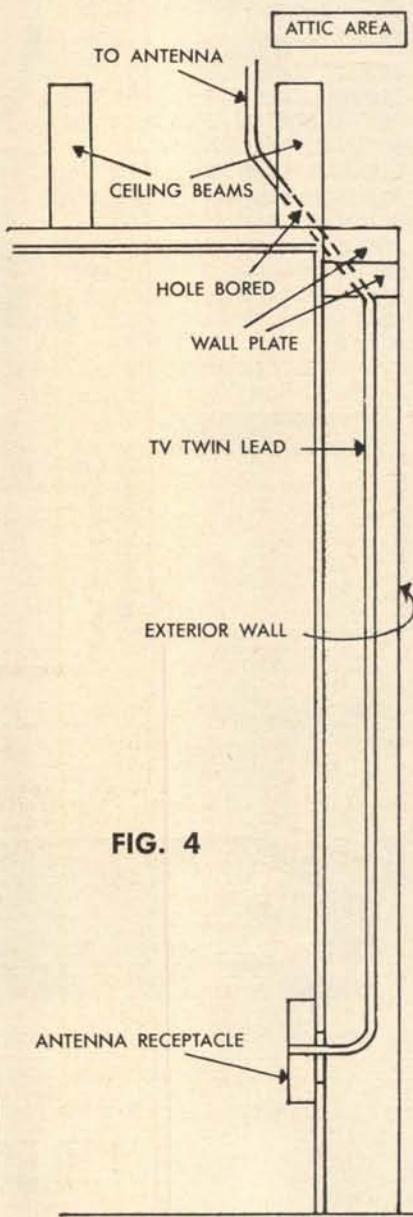


FIG. 4



5. Connections to TV twin-lead are easily made by tightening the two screws that cut into the insulation.



6. Special receptacle fits on clamps previously installed, is held by two machine screws as indicated here.



7. Special plug to match receptacle now is clamped to length of wire that is run to antenna connection on TV set.

the attic. A single wire is run from the adapter to the antenna. Adapters are available for connecting two or more sets to the same antenna. This would permit having receptacles in several rooms so that a portable television set could be moved from room to room and still have the advantage of quick connection to the outside antenna.

The receptacles and plugs, as well as the adapters are available at radio-supply stores and mail-order outlets for radio and electronic supplies. △ △

Calking is an Inside Job

M. ROBERT BEASLEY

Most owners do check the exteriors of their homes in spring and fall and apply calking around doors and windows, or wherever a joint is exposed to the weather. Not too many, however, realize that calking can be used effectively on the interior of the home as well.

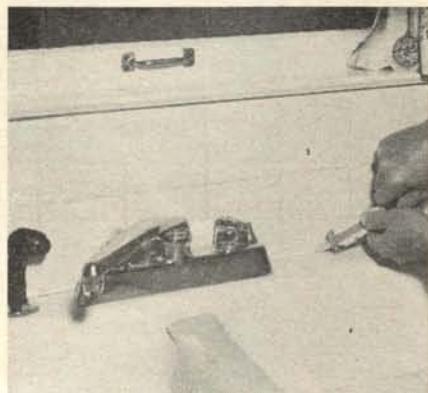
A case in point is around the kitchen sink. This has a natural tendency to pull away from the wall because of its weight and the settling of the house. The resulting cracks will allow the entrance of moisture that can eventually cause serious damage to plaster and the interior wall structure. Bathtubs also tend to pull away from a wall and leave an open joint. Baths and showers provide an extreme moisture condition that definitely will cause a problem with plaster and woodwork. If the bath is upstairs, the moisture can damage the

downstairs ceiling or the walls.

Baseboards that pull away from floors and walls present another spot where calking can be an aid. A neatly applied bead of the material will be almost invisible when its surfaces has set and it is painted.

If you have recently installed wall cabinets and have not yet fitted quarter-round molding or other trim, try calking. It makes a neat joint, will be elastic enough to give with any movement of the structure, and requires no cutting and fitting. The cost of calking is about a penny a foot, much less than the cost of any type of molding.

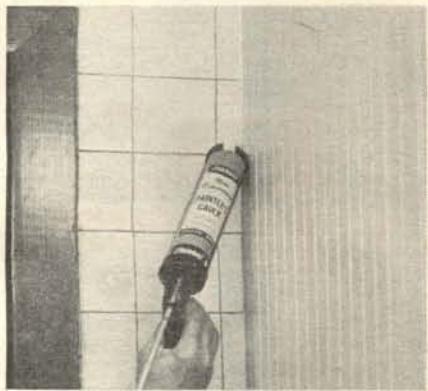
Next time you install metal weatherstripping on doors or windows, apply a bead of calking under the metal. This will prevent moisture getting **under** the weatherstripping and causing rotting. △△



Tips on tubes of calking form proper size bead of material when tube is simply squeezed by hand pressure.



Kitchen sinks and bathtubs will invariably settle and leave opening that will require calking to prevent damage.



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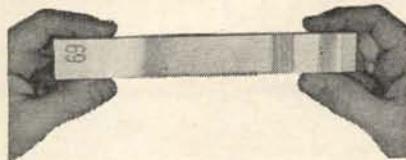
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1. Several coats of paint had been applied to these bricks, and had begun to peel and scale off quite badly.



2. The paint remover paste was applied in a heavy coat, was not brushed out.



3. When area had been covered completely with remover it was allowed to stand overnight.

Refinishing Clinic

REMOVING EXTERIOR FINISHES

Many letters addressed to the Refinishing Clinic have contained questions regarding the removal of finishes from exterior surfaces. Paint and other finishes have been applied to the outside of structures that have wood siding, shingles, stone, brick and other masonry. Paint remover can be used on all these surfaces and the procedure is the same.

To show the actual removal of paint from an exterior surface we hunted around and found a home with a brick fireplace that had many coats of paint that had been on a long time, Fig. 1.

The main problem with using a paint remover outdoors is that it must be a type that will stay wet and continue working long enough to loosen the paint or other finish, despite wind and weather that has a tendency to dry it up. We applied the remover, Fig. 2, with a brush, but did not actually brush the liquid on. Rather, we "flowed" it on so that a thick coating was built up. This application was made late one

afternoon and the remover was left to work all night. A heavy application, Fig. 3, will work for hours while you are doing something else, and eliminate much of the hard work ordinarily required in removing paint and other finishes.

The following morning we returned to the job and first scraped off as much of the loosened paint as possible, Fig. 4. The main reason for doing this, rather than simply flushing the surface with water, was to protect the flowers and grass in the area. Too much of any paint stripper will damage grass and flowers, and precautions should be made accordingly. Newspapers could be used, or inexpensive plastic drop cloths could be used, then thrown away after the job.

After scraping off all the finish possible, we then applied another coat of remover and allowed it to stand for a short while. A wire brush, Fig. 5, then was used to scrub the loosened finish from the pores and rough surface of the

bricks and mortar. The wire brush was dipped in water—the remover used is water-soluble—to speed the job.

The loosened paint and remover then were flushed away with water, Fig. 6. The final result is shown in Fig. 7. The natural red color of the bricks stands out clearly. Which brings a point to mind: check a small area to determine the color of the bricks. We started one job on the brick front of a house that was painted white, then found the bricks were white concrete! The owner of the home decided quickly that removing the paint was not going to improve the appearance of the house, so this job was called off.



4. Next step was to scrape away as much loose paint and remover as possible. This helped protect grass.



5. Wire brush dipped in water removed paint from rough surfaces of brick and mortar; some "elbow grease" is required for the job.

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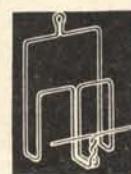
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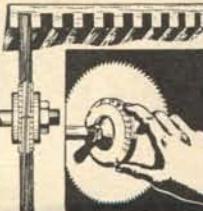
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6. Garden hose was used to flush away loosened paint and remover from the bricks. Remover used, of course, is water-soluble type.

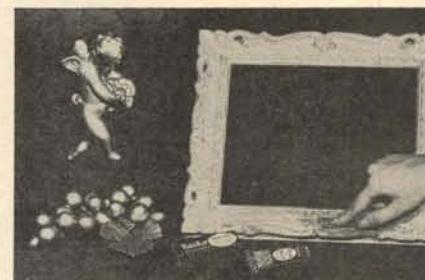


7. Contrast of old surface and area stripped of paint shows the difference a good remover and some elbow grease will make on brick surface.

Q. In following your instructions on antiquing I painted a dresser with white semi-gloss enamel. I then obtained some glazing liquid and, as per your instructions, (March-April, 1963 issue), used color-ground-in-oil to tint the glaze. After I brushed this literally on the entire dresser I found when I started to wipe—again according to your instructions—that the glazing had dried and I could not get it off. What can I do now?

A. Just get some more of the same glazing liquid, but do not add color. Dip a soft cloth in the glazing liquid and scrub the entire surface of the dresser. This will remove the glaze but will not bother the enamel. Be sure to wipe off the loosened glaze as you go along, before it dries again. The next time you apply your colored glazing liquid, do it in small patches and get the wiping operation done before the glaze dries.

Rub 'N Buff Metallic Finish



Q. Since reading your articles my wife has really gotten into the refinishing hobby. The problem is that she never cleans a paintbrush, and lets them get rock hard. What can I do about it?

A. There are many products made specifically for salvaging paint-hardened brushes that can be purchased at any paint or hardware store. However, I recently read a "tip" in a local newspaper stating

Available in five colors, Gold Leaf, Silver Leaf, Copper, Antique Gold and Patina, Rub 'N Buff metallic finishes are packaged in tubes. They are applied with cloth or fingers, then allowed to dry and buffed to a luster in minutes. Can be applied to metal, paper, pottery, wood and almost any surface for ornamental effects. Available at art-supply stores or write direct to American Art Clay Co., Indianapolis, Indiana 46222.

THREE-LEGGED WHATNOT

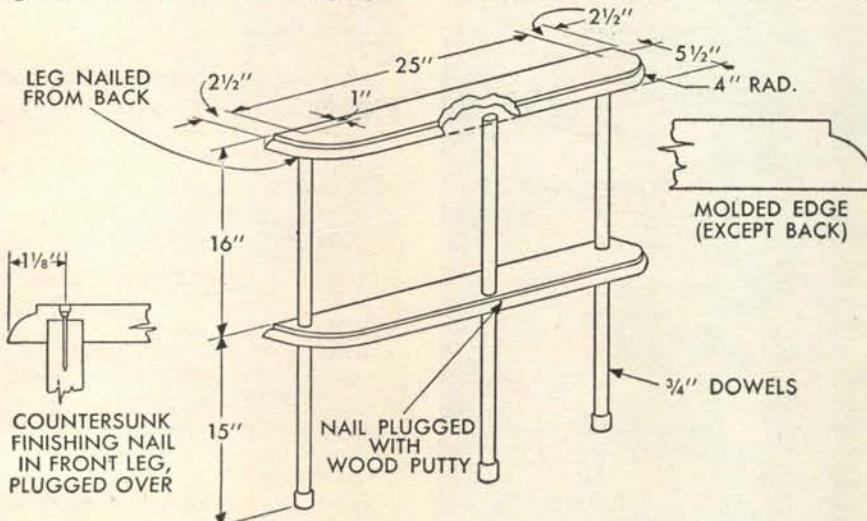
DONALD C. HENDERSON

Construction of this simple shelf unit requires only three lengths of $\frac{3}{4}$ -in. dowel and two lengths of 1 x 6 or 1 x 8 stock. The shelves also can be cut from $\frac{3}{4}$ -in. plywood. In the latter case, use veneer strips on the edges of the shelves to give them the appearance of solid stock. When solid stock is used, a router or shaper can be set up to shape the edges as indicated. No shaping is

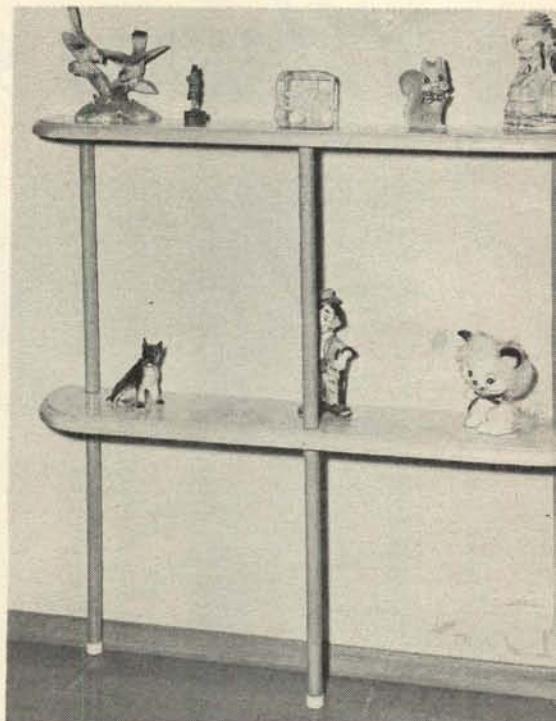
done on the back edges of the shelves.

Holes are bored through the lower shelf; holes in the top shelf are blind. The back legs are positioned by driving finishing nails through the back edge of the shelves into the dowels. The front leg is held by brads driven through the front edge of the lower shelf and through the top of the upper shelf. Glue also is used in each shelf to further secure the shelves.

More than two shelves could be



used, but a third or fourth shelf should be down lower to lower the center of gravity of this free-standing unit. △△



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WORKBENCH

Women's Page



1. This illuminated indoor garden utilizes a 15 x 48-in. "pass-through" in a cabinet. Lamps are concealed in recess in upper portion.

GROW PLANTS UNDER LAMPLIGHT

Your indoor garden will thrive with selected artificial lighting, assuming that the plants are cared for properly in other respects. Special fluorescent lamps that stimulate plant growth are available.

It is a simple matter to arrange an indoor garden in any home. Fig. 1 shows how a "pass-through" in a kitchen cabinet was utilized. Fig. 2 is a metal tray with an attached lighting fixture over it, which can be set on any table or chest. If desired, the lighting fixtures can be suspended from two lengths of chain. Fig. 3 shows a plant shelf and light fixture over it, both supported with shelf brackets. Fig. 4 shows plants on the top shelf of a small wall rack under an existing fluorescent lamp. A floor-type rack, Fig. 5, has greater capacity and can be placed almost anywhere. The cord from the top fixture is run down the outside of one upright, and the cords of the other two fixtures are plugged into cord taps connected to the first. The cords go through holes drilled in the ends of the boxes and through holes in the upright. A switch should be provided to control all fixtures.

Although plants need a period of darkness every day to promote flowering and seeding, artificial illumination can be used for 12 to 18 hours a day. It generally is best to use special grow-type fluorescent lamps such as the Westinghouse "Plant-Gro" or the Sylvania "Gro-Lux". These have a high output of red and blue light in proper proportion to promote fast growth and flowering. Red light alone causes excessive growth and spindly plants with yellowish-green leaves. Blue light alone produces plants that are too short, have dark-green leaves and sparse blossoms.

Excellent results also have been obtained using one "Daylight" fluorescent lamp and one "Natural" fluorescent lamp in each two-lamp fixture. The former has a high blue output, and the latter a high output of red light. Or, you can use "Daylight" lamps in combination with ordinary incandescent lamps of equal wattage. The latter have a high red-light output. This combination has been found to promote even faster growth than the grow-type lamps. When using incandescent lamps be sure that there is

FIG. 2

FLAT-STEEL SUPPORTS,
OR HUNG
WITH CHAIN

TOGGLE SWITCH

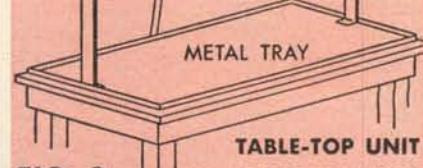
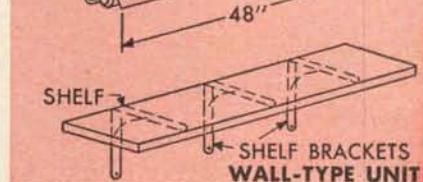


FIG. 3

TABLE-TOP UNIT

SHELF BRACKETS



WALL-TYPE UNIT

enough distance between them and the plants to prevent burning leaves and flowers.

Distance from lamps to plants is important as the light intensity decreases in greater proportion than the distance. For high-intensity illumination with grow-type lamps, the distance from lamps to plant tops should not exceed 8 in. For moderate light intensity, the distance is increased to about 14 in. To accommodate plants of various sizes at the light-intensity distances desired, shelves of a rack such as shown in Fig. 5 are spaced differently.

Some plants require more light than others. For example gloxinias, wax-leaf begonias, geraniums, miniature roses, petunias and orchids thrive best under high light intensity, while rex begonias and caladiums need only moderate light intensity. African violets tolerate quite a range and philodendrons get along well on low intensity.

Be sure to use lighting fixtures with reflectors. Light intensity at a 12-in. distance is increased almost 50 per cent by using a reflector. When lamps age, and dust collects on them and reflectors, intensity diminishes. After a fluorescent lamp has been used about 2,000 hours, its output is decreased about 40 percent. If desired, you can use a time switch to turn the light on and off automatically. When used in damp basements or near grounded electrical devices, the

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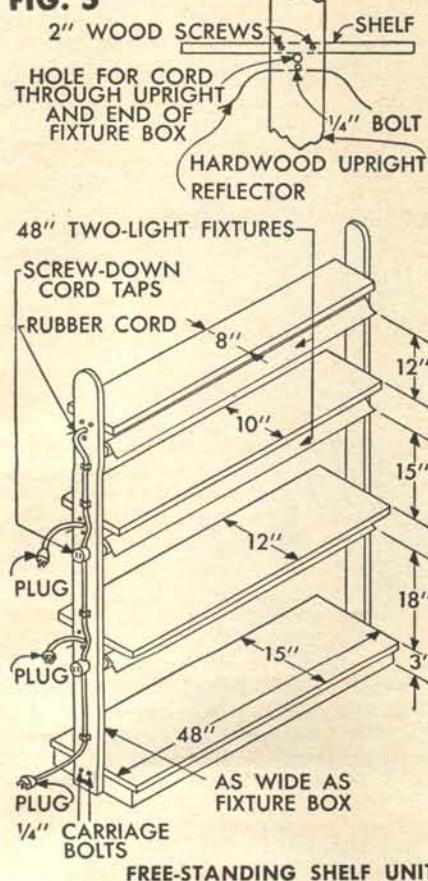
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FIG. 5



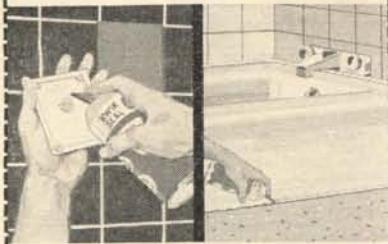
light fixtures should be grounded. Connect a wire to the bared metal of the fixture and to the screw that holds the cover on a wall receptacle, assuming the electrical system has been properly grounded. △ △

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WORKBENCH

Research Department

Each issue in this column we will choose questions on home and shop subjects from letters sent to us. Only those questions which have wide appeal will be answered here. Questions on specialized subjects will be answered by individual letter from the Research Editor's Desk.

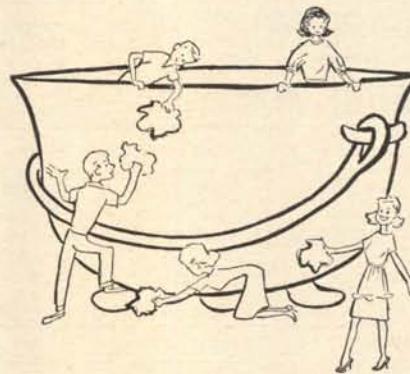
I have a yellow-brass 10-gal. apple-butter kettle that is 75 years old. How can I clean the black from the outside?

D. J. Q., Huntington, W. Va.

The driveway in the rear of my house has never been surfaced, and presents a real mud problem after a heavy rain. At the moment I can't afford to have a concrete or blacktop slab placed, and am wondering if a layer of crushed rock would be of some help in keeping down the mud?

L. D. C., Brighton, Mass.

In the sketch you enclosed you indicated that you were going to put down a layer of sand, then cover this with gravel. We believe that in time the sand and soil will work up through the gravel. If the soil beneath is heavy clay, the sand and gravel will be adequate, but if there is heavy black soil, then it is better to use 2 or 3 in. of coarse gravel as the first layer, rather than sand.



Cleaning, or coloring as it is known in the trade, is a perennial problem for those who collect old brass and copper. Shops that make a business of this kind of thing clean old brass, (also copper and iron), with power-driven wire wheels and cloth buffs charged with a fine abrasive. They can do the job in minutes at nominal cost, and you will get a finish you cannot hope to equal with any hand-applied cleaner and polish. If there is such a shop nearby, we strongly recommend you take the kettle to them for cleaning.

If not, then the next best thing is a hand-applied cleaner and polish. The best we know of are supplied by Competition Chemicals, Box 141, Iowa Falls, Iowa.

Note that when professionals install iron railings on concrete steps that they drill holes, then set the railing posts in a metal or alloy that is poured in the holes. What is this metal and what is its melting point?

E. F. R., Morris Plains, N. J.

Ordinarily, iron railings and ornamental iron posts are set in lead which is melted and poured into the holes drilled or formed in the concrete. Some posts and railings have square pads that are drilled to take screws turned into masonry anchors.



Where can I get small metal ornaments, such as eagles, stars, etc., that are used to decorate small wall shelves and other pine pieces?

E. J. K., Hurley, N. Y.

Write Ball & Ball, Antique Brasses, Whitford, Pa., for brass ornaments in stocks. They also will make brasses to order, if desired. Custom-made ornaments of this type are, of course, relatively expensive. You might also contact S. A. Byers, P. O. Box 3175, Daly City, Calif., for less expensive ornaments of this type.

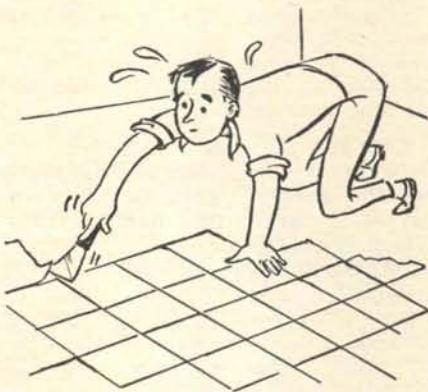
Would like some information on how to straighten a warped door. It is cypress, 7 ft. 10 in. high by 40 in. wide, and has a 26 x 57-in. glass panel in it.

H. R. L., New Orleans, La.

We are sorry, but there just isn't any way you can correct a warped door of the type you describe. That is, any practical method you can carry out yourself. It can be done, of course, but the procedure would cost more in the end than a new door.

I want to put down vinyl floor blocks on our kitchen floor. It now has inlaid-linoleum blocks that will have to be taken up; what is the best method for doing this?

E. F. M., Kansas City, Mo.



Although the procedure is never approved, it is possible to lay a new tile floor over the old, if the latter is in good condition. We hesitate to recommend this procedure but we know it has been done successfully. There is no simple way of taking up floor tile. There is a cement reducer that can be used to soften the cement as you go, after you get up one or two tiles. At best it's a slow and tedious job. A wide chisel is a help in lifting each tile. We know of one case where tiles and linoleum were lifted with the aid of a sod hoe that had been well sharpened with a file. The felt paper underneath was damaged in the process, and also had to be taken up and replaced. It was soaked with a detergent-and-water solution, then a power scrubber was used to loosen it. The final step was the use of elbow grease and a wide putty knife. A couple of days was allowed to make sure the floor dried completely, then new felt was glued to the floor, then the floor tiles were installed.

No matter how you do it, you have a tough, dirty job to tackle.

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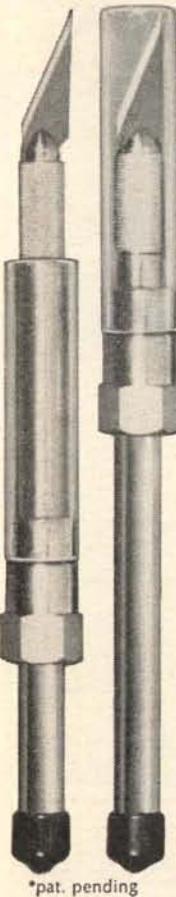
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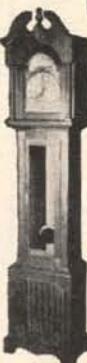
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The heat exchanger of my gas-fired, forced-air furnace makes a loud crackling noise whenever the heater goes on. I figure it probably is due to expansion from the heat, but must it be so loud? This is the fifth season for the furnace, and the noise was heard last year for the first time.

A. R. J., Trenton, New Jersey.

The crackling, or snapping, sound you hear is due, as you say, to expansion in the exchanger. However, the sound could originate in the plenum or even in the ducts and still appear to be in the exchanger.

You do not say, but we assume that the exchanger is of welded sheet steel, rather than being cast or malleable iron. In the late spring and early fall when the burner cycles are at rather long intervals, the exchanger cools down. Later on the cycles will be more frequent and some heat will be retained from one cycle to the next. Then it is quite likely that the noise you hear will be minimized, or may cease altogether. If the furnace is otherwise in good condition, the expansion can do no harm.

Can you give me information as to where I can obtain repair parts for the Jacobs chuck in my drill press? I need the holding ring which is damaged.

L. A. S., Spokane, Wash.

Send an inquiry direct to the manufacturer, the Jacobs Chuck Co., Hartford, Conn., and give the necessary data—number of the chuck, capacity, etc. Or, better still, send the chuck direct to the factory for repair, with a letter in advance addressed to their repair department.

If yours is a genuine Jacobs Chuck in the standard type and size, the name and address of the manufacturer are stamped on the body of the chuck.

I have sharpened a pair of scissors several times, and successfully. I always followed the original slant on the edge of the blade. Now, the blade cuts well up to about $\frac{1}{8}$ in. from the tip; the points now chew and pull. What can I do to correct this condition?

S. J. A., Asheville, N. C.

You probably have sharpened the blades to the point where the edges no longer meet at the ends. Either that or the pivot screw is loose and no longer holds the blades in contact through the length of the cutting edges. We would first tighten the pivot screw, (it will turn hard as these screws always are upset slightly), then examine the blades when closed fully. If the edges do not meet, then it will be necessary to regrind them, shortening the blades so the edges meet and bypass slightly.

We bought a new home last August and in just one heating season the ceilings show dark lines along the ceiling joists. There also are some indications of darkness on the outside walls which are plasterboard, too. The interior walls, however, do not seem to be bothered. What can we do to eliminate the problem; we are afraid that if we just paint that the dark streaks will show through.

E. F. F., Catlin, Ill.

Yours is a common problem and, unfortunately, there is no simple, immediate remedy.

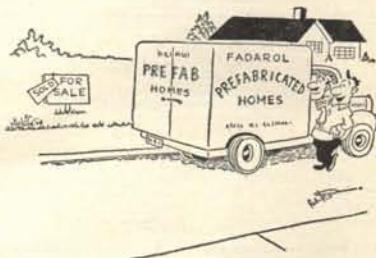
There are several causes, but the most common is the use of unseasoned, (not thoroughly dry), lumber in the framing and ceiling joists. In some instances the condition tends to correct itself, that is, the wood stabilizes at some point; the discoloration ceases at this time and another coat or two of paint covers the defect quite satisfactorily. We'd wait awhile before taking any drastic remedial steps; it is just possible you may be able to cover the defect with paint later on.

Is there any way to straighten the top and leaves of an old cherry table that have been badly warped? I have tried clamping them to a straight plank, but the moment the clamps are loosened the wood twists again.

R. V. S., Richfield Springs, N. Y.

Sorry, but even a year in clamps will not straighten the table top and leaves. They can be straightened only by relieving the stresses that originally caused the wood to warp.

Remove the top and leaves, clamp to a flat surface and run a series of saw cuts on the back, cutting about three-quarters through the stock and stopping the cuts before they run out at the edges. Space the cuts no more than 1 in. apart. You can do it with an electric portable saw, or with a router. Adjust the tool to the proper depth and clamp a guide strip to the table for each pass.



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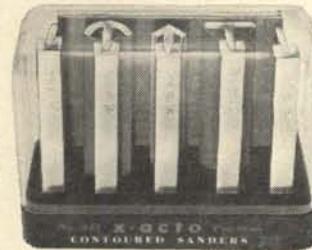
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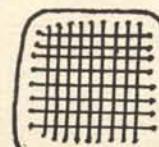
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Book and Booklet Reviews

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This illustrated folder is written especially for do-it-yourselfers, describing how to apply Textolite laminated plastic to table tops, counters and other surfaces. Tips on how to cut the plastic sheets, using just hand tools, how to prepare the surface and install special edgings and moldings are pictured and described. If you are remodeling a kitchen or bath, this folder will come in handy.

CATALOG SUPPLEMENT

Immerman & Sons, Inc.
Dept. (S87), 1924 Euclid Ave.
Cleveland 15, Ohio. 25 cents.

This 32-page supplement to the current Catalog 87 includes many new developments in craft materials. Typical of the new offerings are Sakuragami craft, a low-cost, rice-paper collage medium and ceramic molds for creating plastic jewels.

EDMUND CATALOG NO. 641

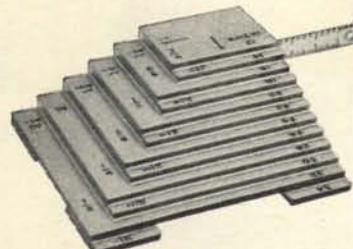
Edmund Scientific Co.
101 E. Gloucester Pike,
Barrington, N. J., 08007.

Clip this review and mail it for free catalog. More than a catalog, this 163-page book is a directory to the space age, and all fields of scientific interest. Included in the book are more than 4,000 product areas, from fish thermometers to bubble sextants, from binoculars to a fabulous Space Clock. Listed is space-age wallpaper with rockets and satellites, and drapes with a Galilean motif. High-school science students will find the catalog especially useful, and Dad will find it fascinating just to browse through the crammed pages.

IN THE NEXT ISSUE

Ceramic-Tile Patio
Pictorial Marquetry
Contemporary Lamps
Colonial Coffee Table
Camper Kitchen

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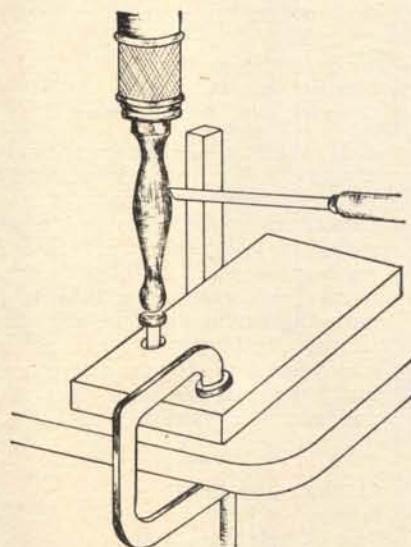
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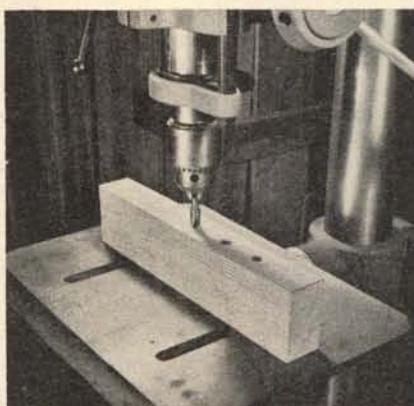
"Vertical Lathe"



When I turned and sanded spindles for a captain's chair using a drill press as a lathe I found a tool rest was necessary. The rest is an L-shape assembly of hardwood clamped to the press table, as detailed. You cannot turn from the "square", but if the stock first is planed or sawed to an octagonal shape it can be turned to the round with a wood-turning chisel.

Jack Hazzard, Washington, D. C.

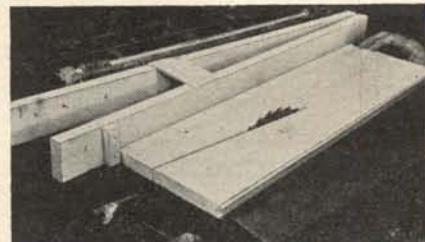
Countersink Counterbore



Lacking a special bit for recessing flathead wood screws, one craftsman used a regular countersink as a counterbore. Because the countersink has little clearance for chips, it is retracted frequently to discharge chips until the proper hole depth is reached.

DeCristoforo, Los Altos, Calif.

Simple Taper Jig

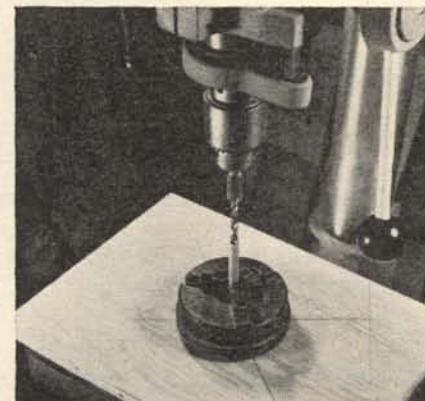


Sawing tapers on your table saw is no problem with a taper jig. Hinge two 4-ft. lengths of 1 x 3 lumber at one end, then nail a small strip across the outside face of one piece about 6 in. from the end. In use, place the jig on the saw table, open the leaves of the jig to get the proper angle of taper, then nail a small strip across the tops of the leaves to hold them in position. The workpiece pushes the jig.

Miter-Gauge Grip

Using sandpaper on a miter gauge to prevent the stock from slipping is not a new idea, but there often is a problem of what adhesive to use. I find that the cement used to hold abrasive paper on sanding disk works the best. This permits easily peeling the paper from the miter gauge when it becomes worn.

Chuck Is Vise

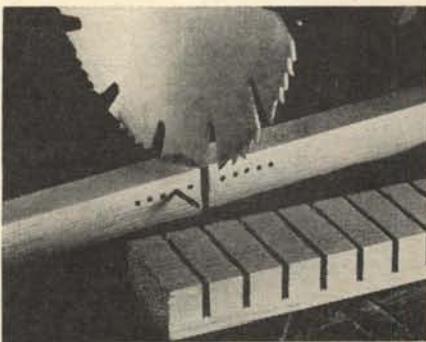


For concentric drilling of round stock the 3-jaw chuck from a lathe makes an ideal vise. Fit the chuck collar in a hole cut in a board so it is held securely. Then, when the chuck is centered with the drill-press spindle, any diameter of work within the capacities of the chuck automatically will be positioned for center-drilling.

Lead Wool Holds Screws

Towel racks and other wall-hung articles often must be located so screws cannot be driven into wall studs for maximum holding power. If you do not have an expansion sleeve handy, or other type screw anchor, you can follow an effective method of anchoring that is used for attaching wall mirrors. After drilling a $\frac{1}{4}$ -in. hole about two-thirds through the thickness of plaster or plasterboard, pack this with lead wool, obtainable from a plumbing shop. Use a small screw driver or dowel to compress the wool in the hole, taking care not to break through the plaster. Driving the wood screw into this compressed wad will spread it tightly against the side of the hole and anchor the screw firmly.

Kerf-Spacing Setup



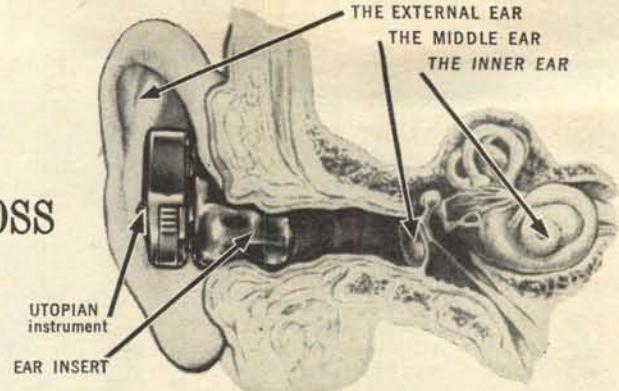
Spacing of uniform kerfs, such as might be needed for wood bending, can be a tedious job unless you provide a means of establishing the spacing. This is done easily on a radial-arm saw by drilling a few equally-spaced holes on each side of the saw-blade cut in the fence. A nail passed through a hole in the fence engages the first cut and positions the work for the following cut. *DeCristoforo, Los Altos, Calif.*

Improved Worm Gear

You can eliminate the intricate job of machining or filing to make a tiny worm gear for a toy or model if the gear does not require precision work, by simply soldering an expanded coil of wire to a shaft. Select wire of the proper thickness, wrap it tightly around a shaft slightly less in diameter than the one it will fit because a coil so formed will enlarge slightly when released from the pull of wrapping. Make the coil two or three times longer than needed and lengthen it by pulling both ends so the turns provide the desired pitch of gear teeth. Cut off the section having the most uniformly spaced coils to the required length and slip it on the gear shaft. Apply flux and sweat-solder the coil to the shaft.

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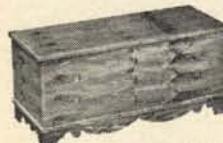
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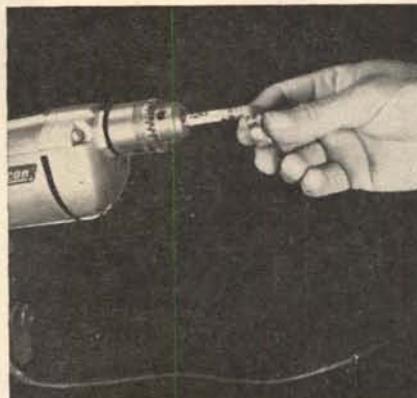
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Don't miss the next exciting issue!

Eraser Is Polisher

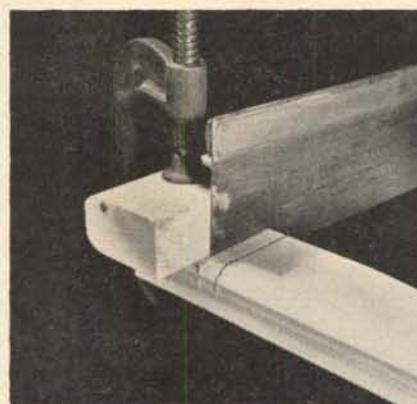


Chucking the eraser end of a wooden pencil in a portable drill or drill press makes it an ideal tool for polishing small jewelry items. Remember the eraser is a "polisher"—don't depend on it to remove deep scratches. They are best removed with fine emery or crocus cloth, after which the eraser can be used to polish.

Removing Pencil Marks

Do not try to remove pencil marks from wood with sandpaper. Quite often the sandpaper will grind the graphite deeper into the wood and make it more difficult to remove. Instead, use a pencil eraser, then finish up with sandpaper, working with the grain.

Square Saw Cuts



Making square cuts with a hand saw is not the easiest job in the world, especially if you have not had much experience. One way to guarantee a better job is to clamp a block to the work, so it will hold the saw square to the work surface and also provide a straight-line guide. In the example shown, a back saw is used to make the outlining cuts for a dado. *DeCristoforo, Los Altos, Calif.*

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QUALITY POWER TOOLS SINCE 1934

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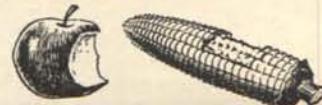
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"There's a new indoor pastime I'd been introduced to recently that has me wondering where it's been all my life. Until I outfitted the basement of my new home with a set of American Machine power tools, I had no idea how much fun it could be to make things out of wood—nor how easy it can really be. I am constantly amazed with the accuracy, speed and ease with which I can now make useful and beautiful things for the house, for the kids—and for my own pleasure and convenience. I don't know how they do it, but the remarkable low cost of these professional quality tools has taken nothing away from their ability to do a job."

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8" TILT ARBOR
POWER
SAW

\$14.95

f.o.b. factory. Wt. 25 lbs.

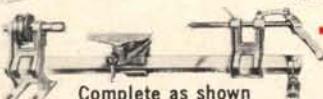
Includes completely assembled cast iron and steel 8" tilt arbor power saw with ground cast iron table . . . less blade. If desired, RIP FENCE for easier work alignment, \$3.50 additional.



6" SWING
3-FT. LATHE
\$9.85

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Optional Faceplate for turning bowls, trays, lamp bases, rosettes, etc. \$2.50



Complete as shown

DELUXE
BALL BEARING
WOOD SHAPER
KIT

\$14.95

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Complete less
wood parts, motor
Hold-down assembly
optional—\$2.75



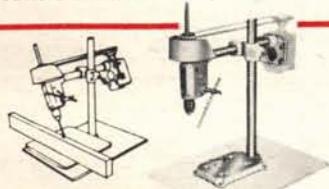
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Makes decorator edges on furniture, forms beads, coves, moldings, tongue-in-groove joints, etc. A-B-C plans make assembly a breeze. Everything incl. but plywood for table, skirt. Greased-for-life ball bearings in sealed cast iron housing; fully adjustable, easily accessible cutter height control, fence assembly. Precision-machined for smooth, accurate cuts at high speed. Takes 1/4 h.p. or larger motor, standard cutters avail. at Sears, other retailers.

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GREAT
DEAL MORE



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REVOLUTIONARY PATENTS DECREASE COSTS, INCREASE EFFICIENCY

Full scale power tools of heavy duty 100% cast iron and steel. Streamlined design reduces weight, cuts material and production costs. Special patents provide added efficiency, accuracy, savings. Parts made, assembled, tested and packed right in our own factories, shipped direct . . . save store profits.

DOES WORK OF \$75 BENCH SAW

as is. Converts easily to equal any \$300 floor model cabinet units! Crosscuts, rips, mitres, cuts compound angles, dadoes, makes coves and mouldings. FREE CABINET BASE PLANS

Use as portable bench saw as received (inset photo) . . . or transform easily and inexpensively into floor model (as shown) guar. to do work of floor models costing \$300. FREE plans . . . sheet of 3/4" plywood and 3-4 hours are all you'll need. Use your AMCO saw for cutting. Plans provide 27" x 24" work surface, 33" height, pullout saw-dust bin, tool storage compartment.

UNCONDITIONAL 10 YEAR GUARANTEE

BLADE TIETS . . . TABLE STAYS LEVEL

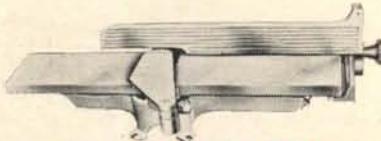
• Locks securely at any angle to 50°, raises, lowers 0"-2 1/4" • Patented tilt mechanism, accurate etched scale • Patented motor mount takes std. 1/4 h.p. or larger motor, keeps belt tight, assures perfect alignment at any angle, transmits full power • Takes std. blade, saw insert removes to take dadoe heads, cutters, etc. (not incl.) • Accurate mitre gauge assembly • Ground spindle • Enclosed steel base • "Compo" bearings • Accessories available at factory prices • RIP FENCE, if desired for easier work alignment: Std. size (for bench saw) \$3.50; larger fence (for cabinet base, as ill'd.) \$4.50.

FULL 22" LONG, 4 1/8"
JOINTER-PLANER
\$19.95

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Factory
Complete
as shown

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MORE THAN
500,000
USERS

100%
precision
ground
cast iron
and steel.



DOES WORK OF \$60 UNITS

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at any depth • Rabett depth 1/8" • Hardened, ground high speed steel knives • Patent-pending fence adjustable to any position, any angle 0°-50° • Patent pending lift-off guard (nothing to loosen!) • Balanced steel cutter head.

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